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Lectures
on the
Institutes of Physic
By

Wm Cullen M.D.

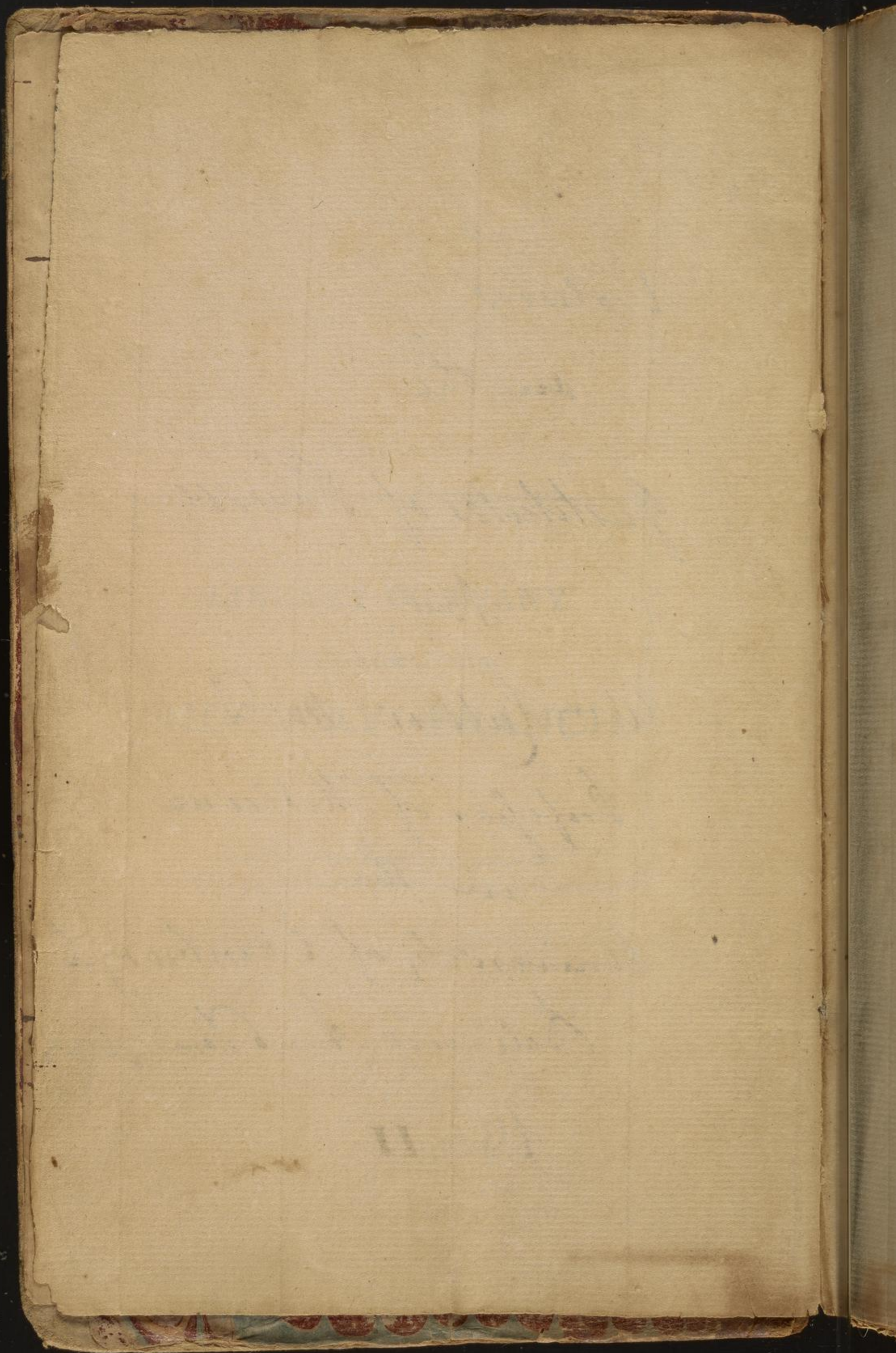
Professor of Medicine
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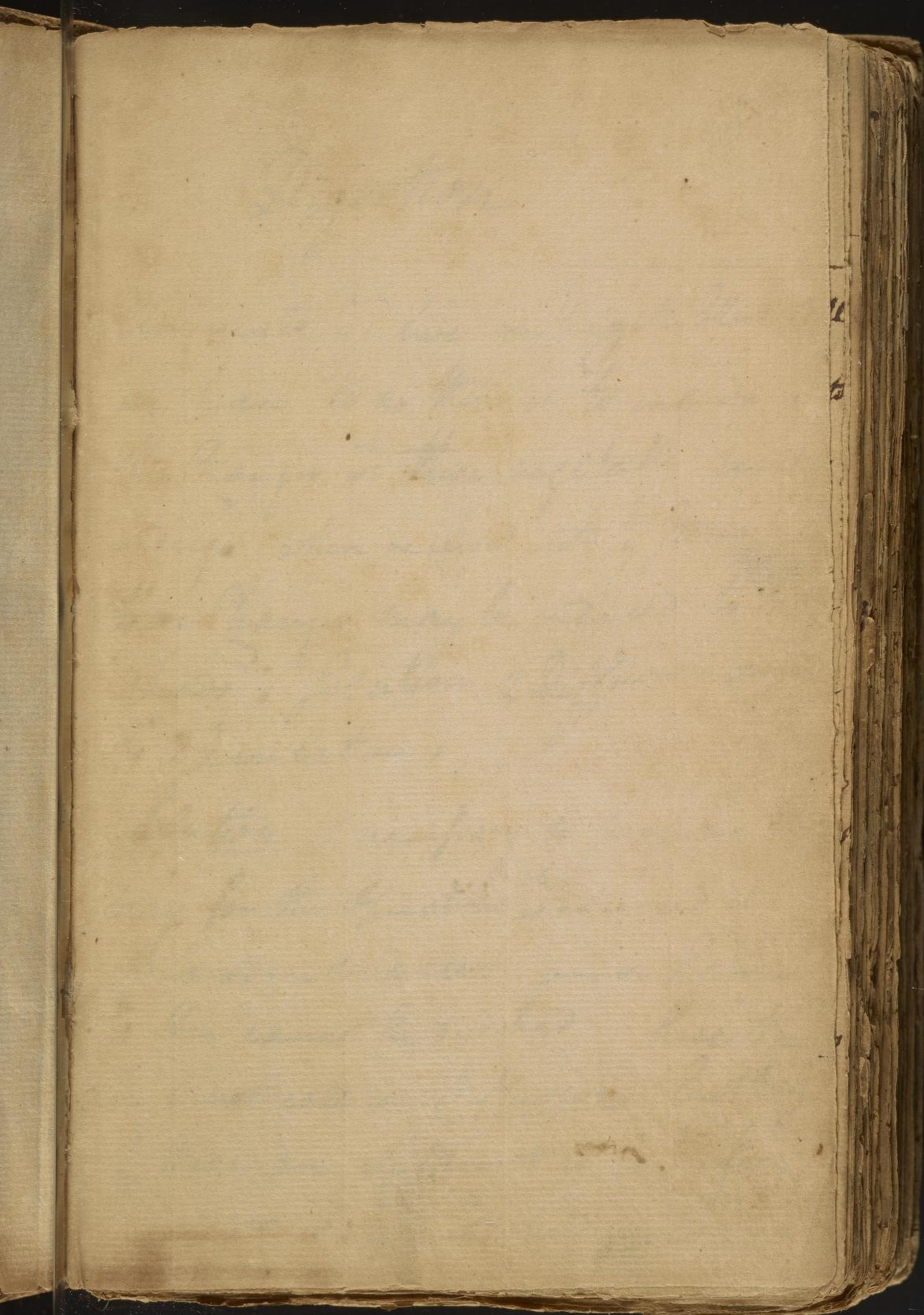
University of Edinburgh
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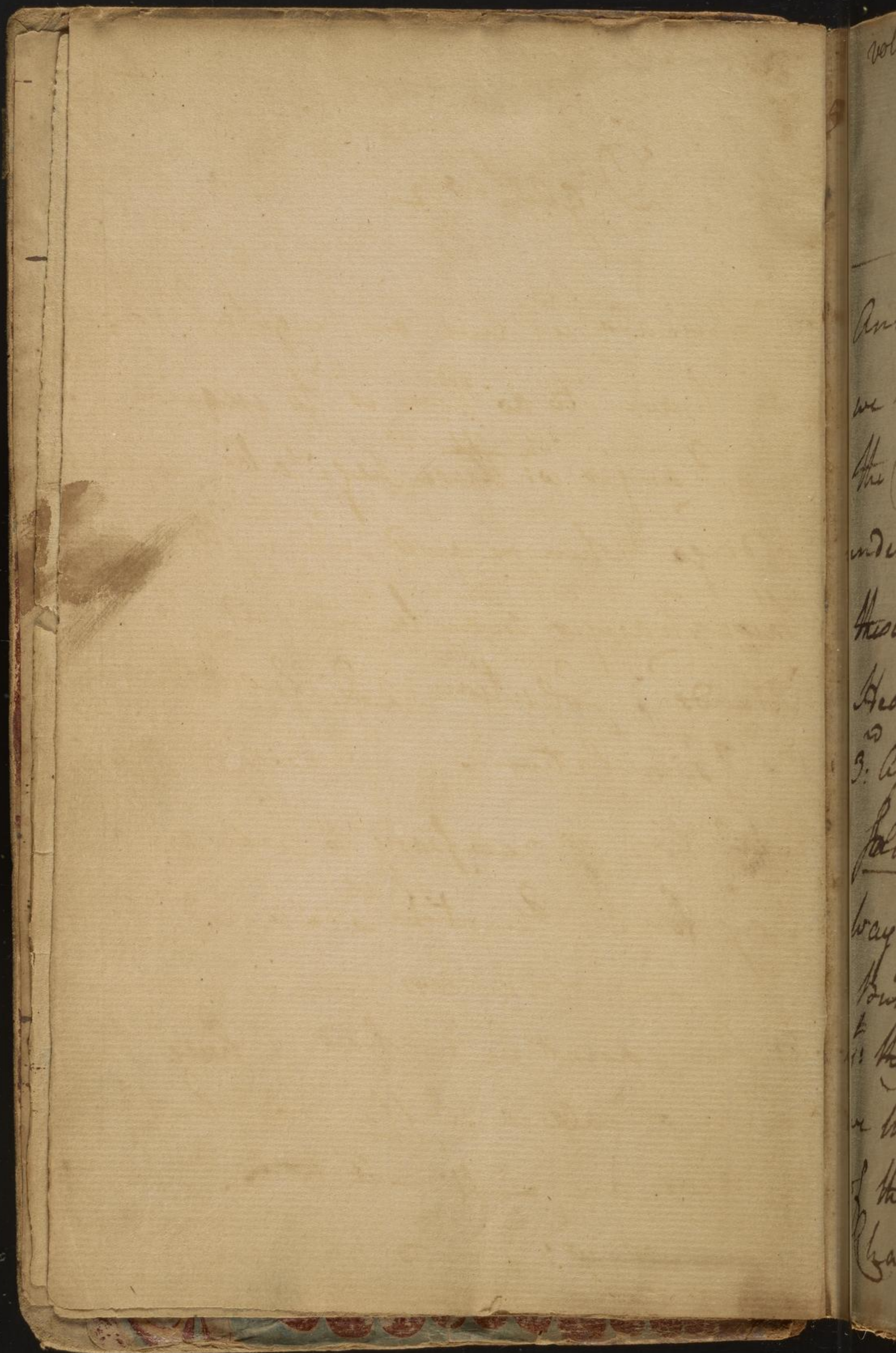
Vol: II

Written by

Benjamin Rush





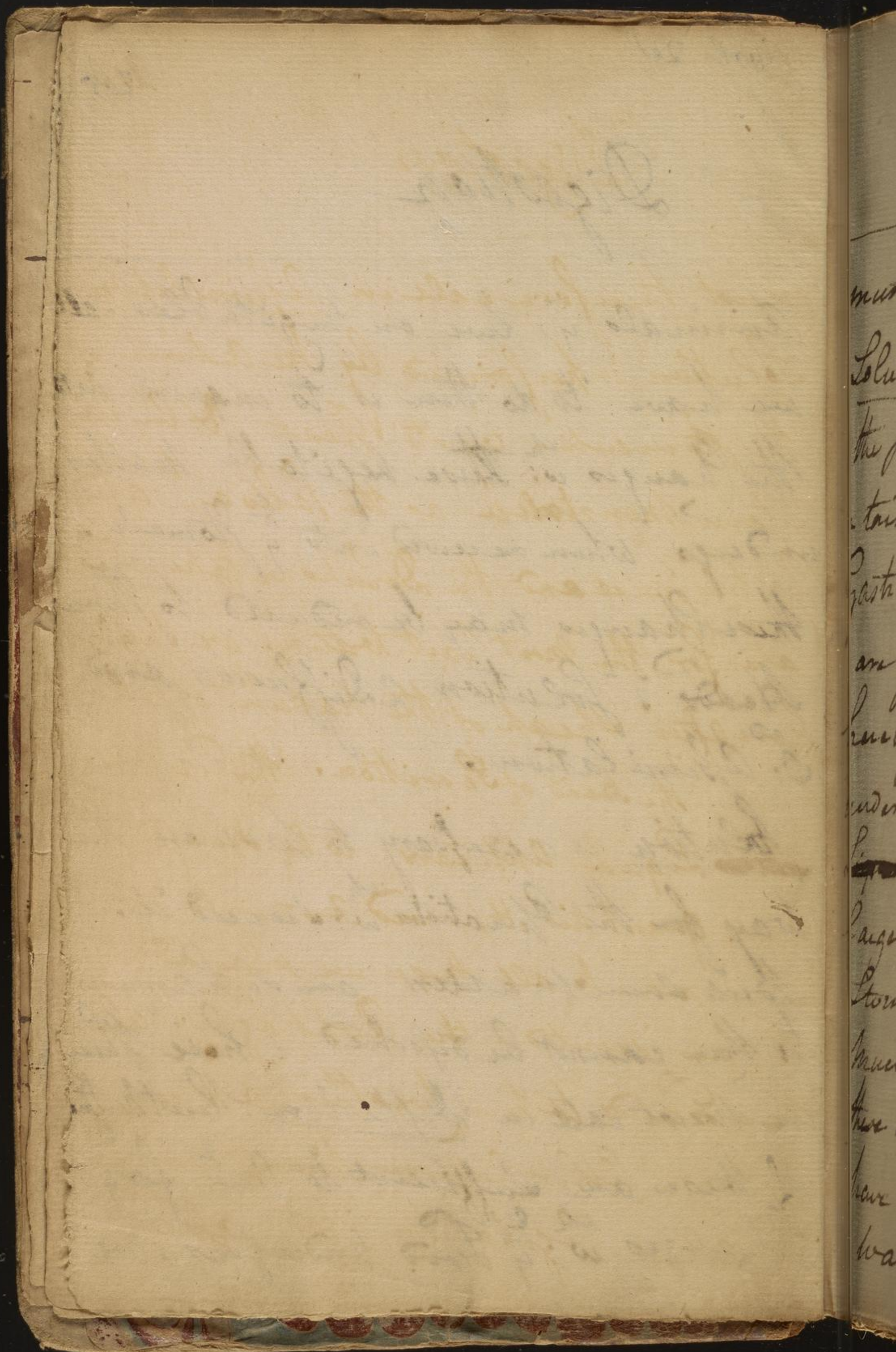


Digestion

Animals ^{live} on vegetables - all we have to do then is to enquire into the changes ⁱⁿ these vegetable matters undergo when received into ^{the} stomach - these changes may be reduced to three heads: 1. solution 2. Diffusion and 3. Assimilation.

Solution is necessary to prepare the way for the Operations ⁱⁿ which succeed it.

But some matters are so heterogeneous ^{that} they cannot be dissolved, hence then we must call in Diffusion. But neither of these are sufficient to ^{prepare} for ^{the} changes ⁱⁿ which Food undergoes, we



Digestion

must therefore call in Assimilation
Solution is performed by the action of
the stomach - by its Heat - & by cer-
tain Menstrua as the saliva, and
Gastric juice and the Drinks we take in:
are for the most part water. we shall
hereafter speak of the nature of saliva
under the head of Secretion. the Gastric
~~Liquor~~ Liquor appears to be secreted in
large quantities & poured out into the
Stomach. to all these we may add the
Mucus secreted in the Oesophagus. all
these fluids taken together appear to
have no other action than common
water. Agitation is necessary

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Digestion

to promote this Solution in Order to
 suspend the matter to be dissolved. this
 Agitation is occasioned chiefly by a
 Peristaltic motion in the stomach. every
 Other kind of Agitation is trifling and
 does not deserve our notice. Another Assistance
 to Solution is Heat. Some have supposed
 it to be a principal power. but this is
 false. it never exceeds 98° . Such a de-
 -gree of Heat but little increases the dis-
 -solving power of water. a Degree of Heat
 above 98° coagulates Animal Matter.
 So y° it is ~~un~~ necessary to call in
 a higher Degree of Heat $\frac{y}{2}$ we have.

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Digestion

The Heat of the circumjacent Viscera can add nothing to the Heat of the Stomach as they never exceed it by 1 Degree. Dr. Haller imagines y^t the Heat of the stomach is increased by its Crisise being shut during Digestion, but he is mistaken for no such shutting of the Crisise of the stomach ever takes place.

many Physiologists have supposed y^t Digestion is carried on by this solution only. but this cannot be, for we find many matters are incapable of solution in the stomach.

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Digestion

Neither can Triture alone have any great Action. I have known Stones, hard pus & even Soap = pills discharged without undergoing the least change.

Besides we never can by any Experimentth wth Solution or Triture form a liquor y^e has any Analogy wth Chyle. we must therefore call in another power to assist for Digestion viz: Fermentation.

- This power acts by extricating Fixed Air from Aliment, & thus forwards its Revolution. take Notice here I do not suppose

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Digestion

Fixed air to be $\frac{2}{3}$ Cement of solid Bodies. the Attraction of cohesion depends upon $\frac{2}{3}$ joint nature of all $\frac{2}{3}$ Bodies which compose it, & not upon any One of them acting as a Cement to the Rest. a difficult Problem occurs here & y^e is how are $\frac{2}{3}$ oil & watery parts of our Aliment mixt together? I believe they are never mixt. - the oil appears only to be diffused, even in the Milk itself w^{ch} is formed from the Chyle. Some suppose the Saliva & Bile to be of a Lachrymous nature

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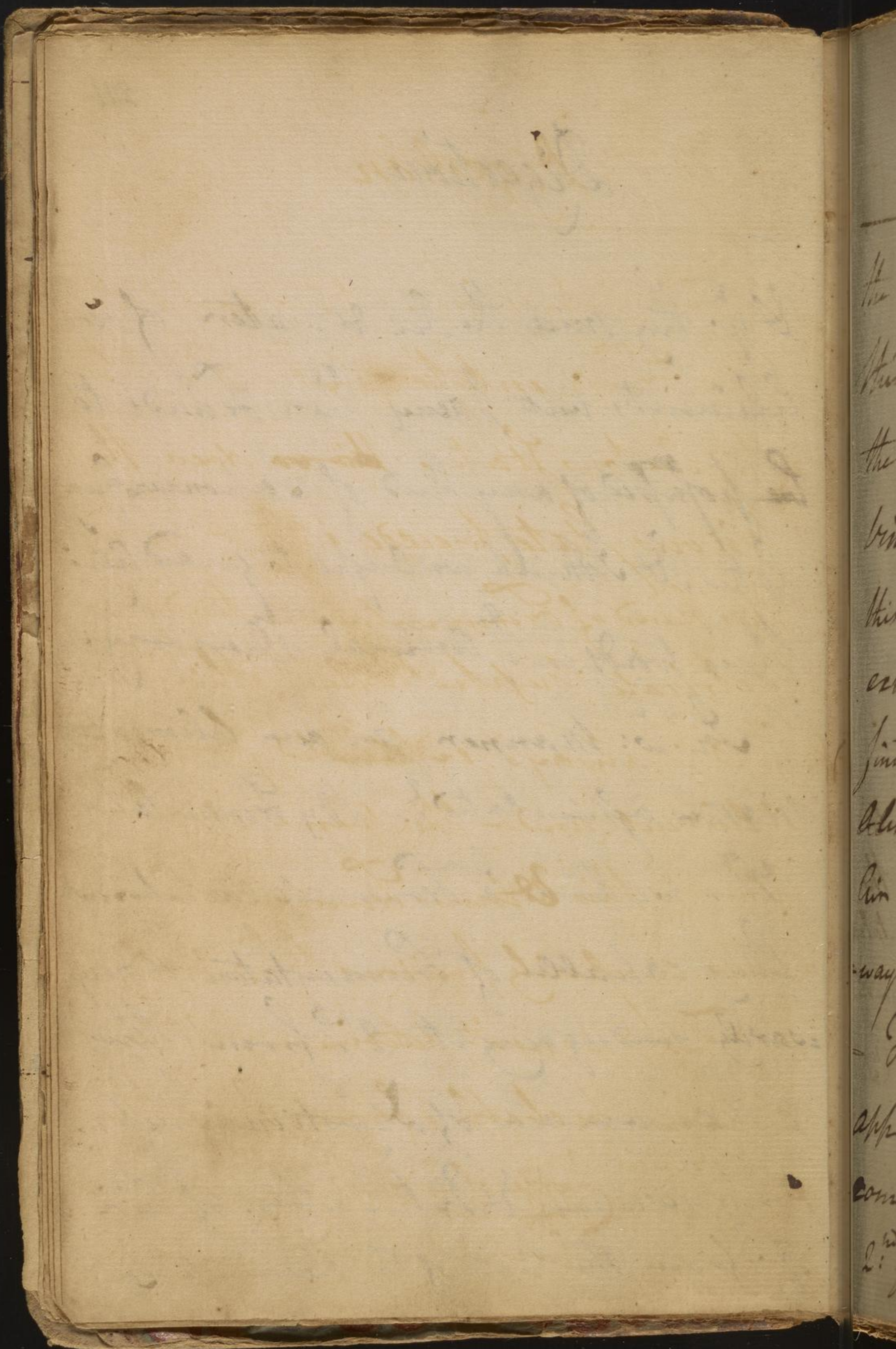
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Digestion

2^d: they mix the Oil & water of our
 Aliment, but I deny these Fluids to
 be possessed of any kind of Saponaceous qua-
 lities, & I think we ought to guard agst
 these words in ^{the} Animal Chemistry.

In w^h manner are our alimentary
 matters assimilated? - By Fermentation.

This we prove 1st from all our Aliment
 being capable of Fermentation, & neces-
 sarily undergoing it 2^d from the
 Phenomena of Digestion, such as
 Fermentation & Exhalation of Air
 3^d from the Heat of the Ferment, &c



Digestion

the Air taken in. how far does
this Fermentation extend? - to
the Aërous State. ~~this~~ does the
vinous State precede it? - we know
this kind of Fermentation tends to
extricate Mephitic Air, which we
find is always extricated from our
Aliment under the name of Mephitic
Air. Is this Vinous Fermentation al-
ways necessarily previous to ^{the} Aërous?

- This I cannot determine Altho it
appears probable & from its being the
common course of fermenting Bodies.

2nd from a sweetish proceeding & Aërous Ferment.

(a) See Dr. Ramsay's Experiments
(b) The Mephitic Air exhaled from the
Lungs may arise 1st from a Fermentation
or incipient Putrefaction going on in the
Blood, or 2nd from a mixture of the Chyle
& Blood together.

Digestion

Dr. Haller mentions many authors w:^{ch}
 I have not been able to read who all de-
 -clare they have found an acid in y^e Stom-
 -ach. all Patients when they throw up
 the Contents of their Stomachs, show the
 marks of an acid in it. This acid is destroy-
 -ed by mixing w:th the Bile by w:^{ch} means
 the Bitterness of the Bile as well as the
 Acidity of the Aliment is obtunded, &
 from this is formed that bland Liquor we
 call Chyle. This is absorbed into the Lactials.
 But how? Is it by Capillary, or by
 -two Attractions? - Dr. Boerhaave & every
 Conjecture that has been formed, concerning
 the further Changes of y^e Chyle is vague and
 uncertain. C.

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Assimilation

How long does the Chyle continue before it becomes Blood? — Some suppose 12 hours. This they infer from the white Colour on Blood drawn from y^e Arm. — But this white Colour depends upon the separation of the coagulable Lymph, & has no connection wth the Chyle. for my part I cannot imagine Chyle is ever found in the Aortic System except in the case of Section in the Mammary. It is probable the sanguification is not perfected in the Lungs, but I doubt whether Chyle ever appears after it has circulated Once thro the Lungs.

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Blood

This Fluid appears to be a ~~homoge-~~
neous mass, but Experiments teach us
that it is a very Heterogeneous mass.

— Blood when drawn emits a sensible
vapour & wth that loses a sensible
portion of its weight. This portion
differs according to the Degree of
Heat, or the Quantity of Blood
exposed. When the Blood concretes it
forms a gelatinous mass, & after a
while separates into 2 parts. the one
a solid red part, the other a fluid
colourless part or sometimes a little
yellow. The 1st is called Crux, ~~Crux~~
Crassamentum. the 2^d Serum.

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Blood

The Crassimentum is again divided into
2 parts. 1: ^{red} Globules, 2: a
white tough gelatinous part called
the Buff Coat. th It has long been
supposed to be a morbid affection
in the blood. but it is constantly
present, & may be demonstrated
by pouring water on some blood
laid on a plate by th w: means all
the red parts of the blood will be
washed away, & the supposed morbid
sly coat appears. Senac calls this
part of the blood coagulable Lymph.
I shall distinguish it only by ² y:
name of Lymph. The serum

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Blood

appears to be Homogeneous,
but Experiments teach us it is
not. if we expose it to a certain
Degree of Heat it coagulates like
Lymph, & exhales a very volatile
Matter which exactly resembles the
Calitus we before spoke of.

The Parts then ² of which the
Blood are Red Globules - Lymph -
the Serum, or w^h I chuse to call by
the name of Serousity. I will not
call these the Constituent parts of
the Blood. Other matters may be Occa-
sionally there. By what means
is the Blood kept Diffused? By

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Blood

Heat, hence we find the Separation we
 before spoke of never takes place in
 a Degree of Heat equal to $\frac{1}{2}$ of $\frac{1}{2}$ animal
 body. The Calities too, which exhalate
 when the blood is drawn, may tend
 to keep the blood in a more diffused
 homogeneous state. The Circumstances
 of Drawing blood likewise considerably
 influence its appearance. The larger
 the stream, & deeper the vessel, the
 quicker the Separation & vice versa.
 - This Experiment holds equally the same
 in all Inflam^y Diseases. From all
 this you see how little Dependance
 is to be placed on the Appearance
 of the blood in enquiring into the

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State of the Solids. formerly the only
Attention was paid to the Blood, in
Diseases, but from w^h you have
heard, you are I dare say fully
convinced, how very fallacious such
Observations must be.

The Red Globules are not mixed
wth the Lymph, but diffused only, hence
the Readiness they show to separate
when Heat & Moisture are withdrawn.

The Coagulable Lymph sometimes
separates from the Serum & red
Globules even in the Body when their
Union is less firm than it should
be, or when a sufficient Depre

118

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of Heat to keep them united, ^{is wanting} or when
a Substance is applied to it to which
it has a stronger Attraction than to
the red Globules. Hence we find if an
Artery is deprived of its Exudation the
Lymph is more strongly attracted
by it, & thus constitutes Polyperus.

The Spontaneous stopping of He-
morrhages depends upon the same
Cause. viz: the Lymph coagulating
& forming a Thrombus round the
Bleeding Artery.

The Serosity is of great Fluidity.
- is very volatile, & by its greater
Ester Resake favours the Coagulation

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of what is left behind. hence the quantity
of Crassimentum obtained in Bleeding &
will depend upon those circumstances
^{ch} influence the Separation of the
Serosity, such as Heat, breadth &c.

The Separation of the Lymph likewise
depends upon several Circumstances,
such as the Stream - the Degree of Heat -

the agitation it undergoes - the
Form of the vessel in ^{ch} it falls - to-
gether wth the matter of w^{ch} the vessel is
made. The Separation is easiest and
quickest in Earthen vessels. even in
those Cases where the Lymph is
dense, & formed into a little hollow

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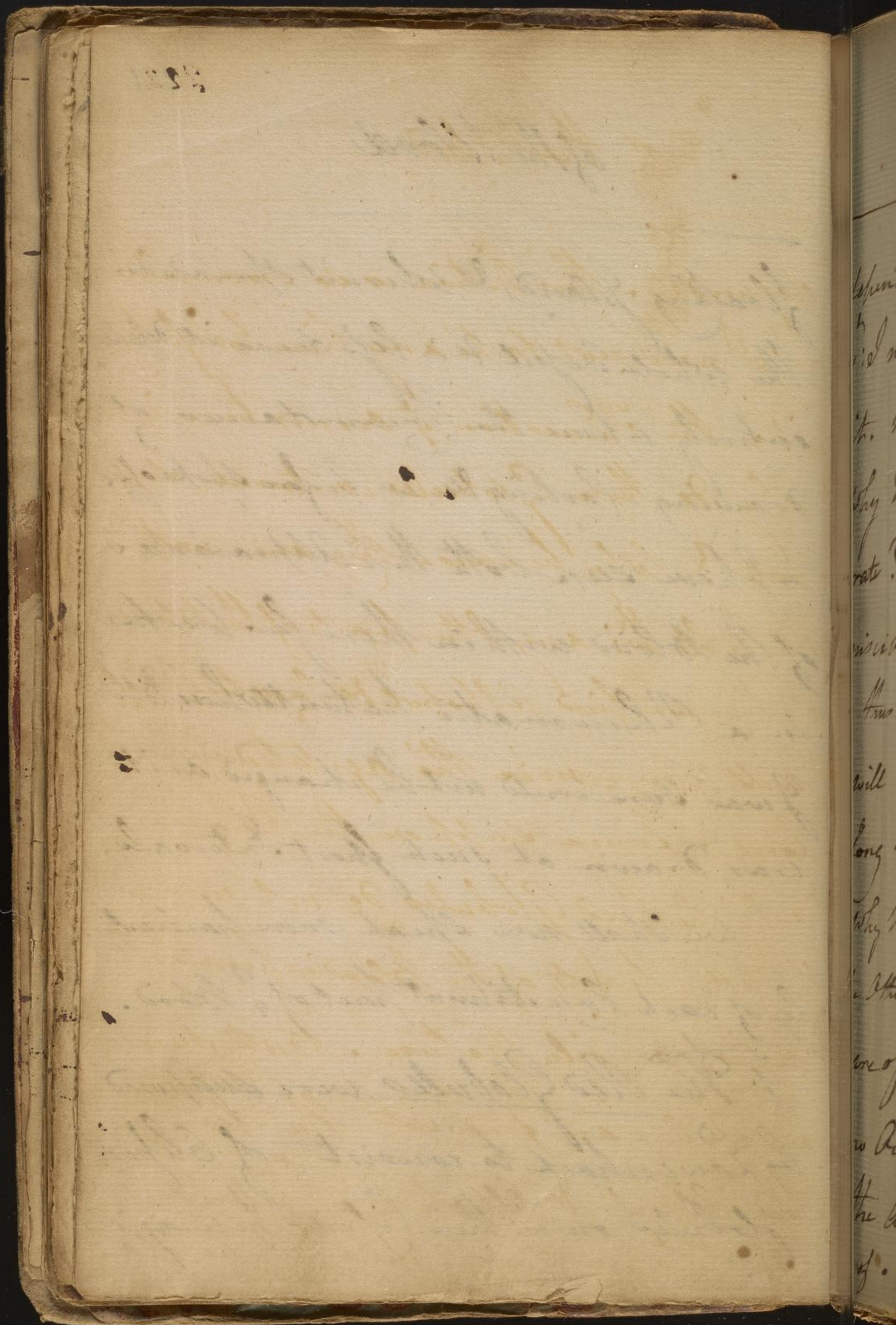
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of the Blood

floating Island, & where it spreads over
the whole vessel & is less dense it depends
entirely upon the Circumstances of
drawing - Cooling &c we before spoke of.
- I have seen both these Appearances
of the blood within these few weeks
in a Rheumatic patient whose blood
I was sure would not be changed as it
was drawn at such short Intervals.

We shall now speak more particular-
ly of each Constituent part of ^{the} Blood.

1. The Red Globules were supposed
by Lowerhock to consist of Glass
Globules on w^{ch} their Colour being imaged



of the Blood

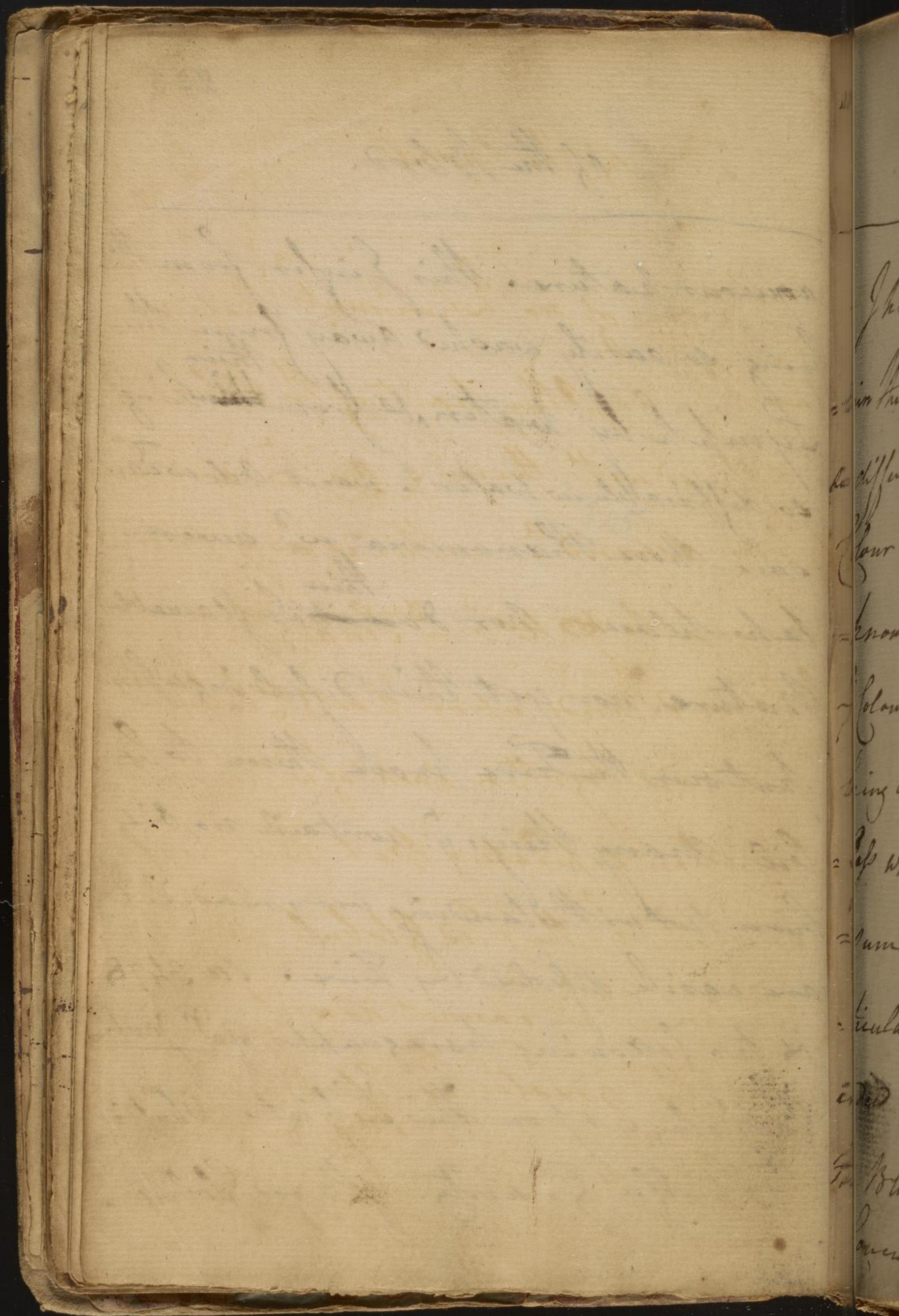
depended. This notion is so erroneous
 y^t I need not take any time to refute
 it. The ^{only} Question y^t occurs here is
 why do these Globules continue sepa-
 -rate? Why because they are not
 miscible wth any other parts of the blood.
 - Thus we find Alcohol & Caustic Alkali
 will never mix tho' agitated ever so
 long. Some suppose the Reason
 why the Red Globules do not mix wth
 the other parts of the Blood is because they
 are of an oily nature. But surely
 no Oil can prevent the Union of
 the Alkali & Alcohol we before spoke
 of. To me they appear to be of an

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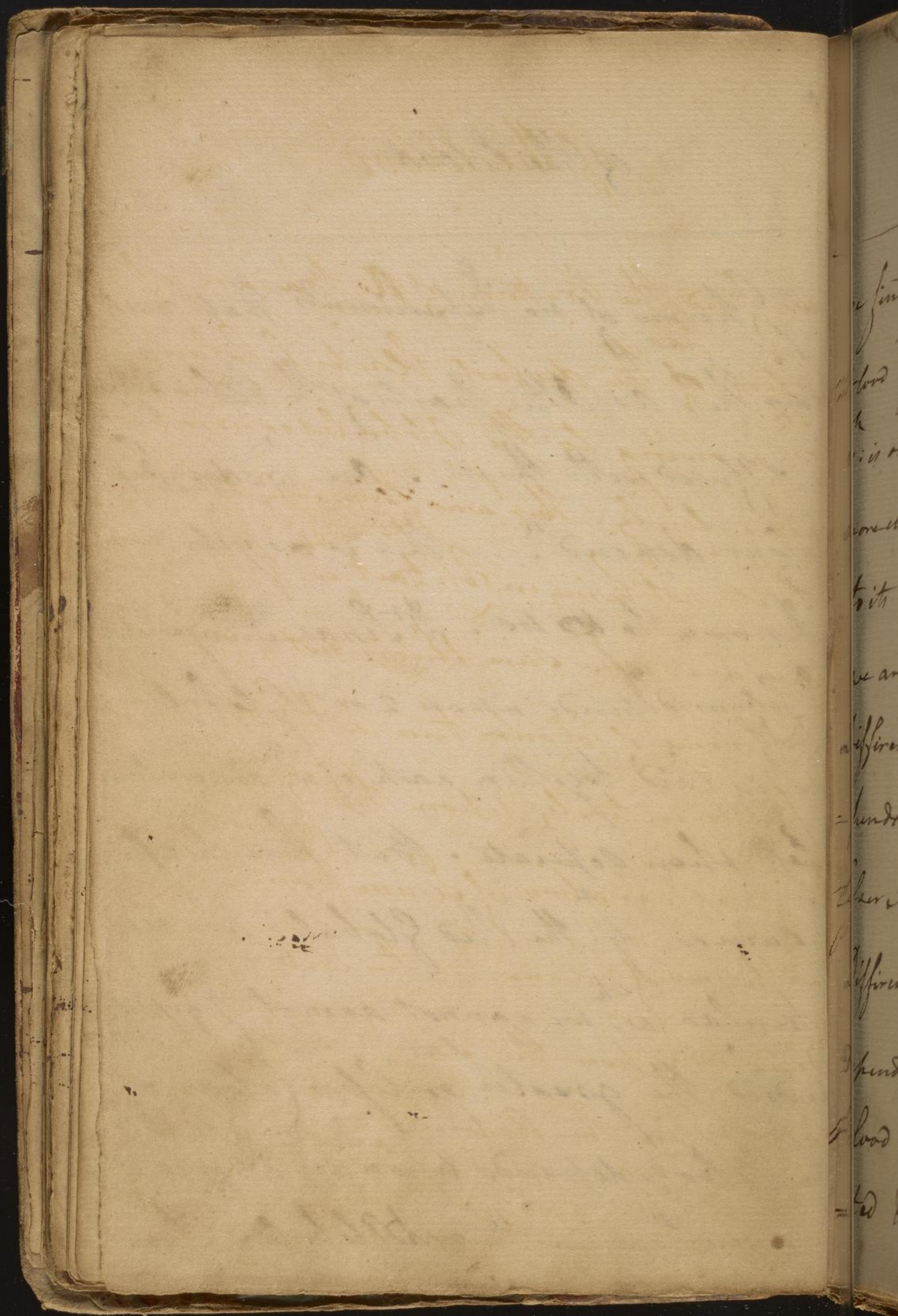
of the blood.

aqueous nature. This I infer from their
 being so easily washed away from the
 Lymph by water, & from ^{their} ~~the~~ being
 so diffusible in water. was it oil we are
 sure these Phenomena w^d never
 take place. Nor do ^{their} ~~it~~ inflammable
 nature, nor yet their dissolving when
 put over the fire prove them to be
 oil, many things y^t contain no oil
 burn notwithstanding very readily &
 are easily dissolved by fire. see 3478
 & two following paragraphs of Dr Gaubius
 Pathology upon this Subject. What is
 the specific Gravity of the red Globules?



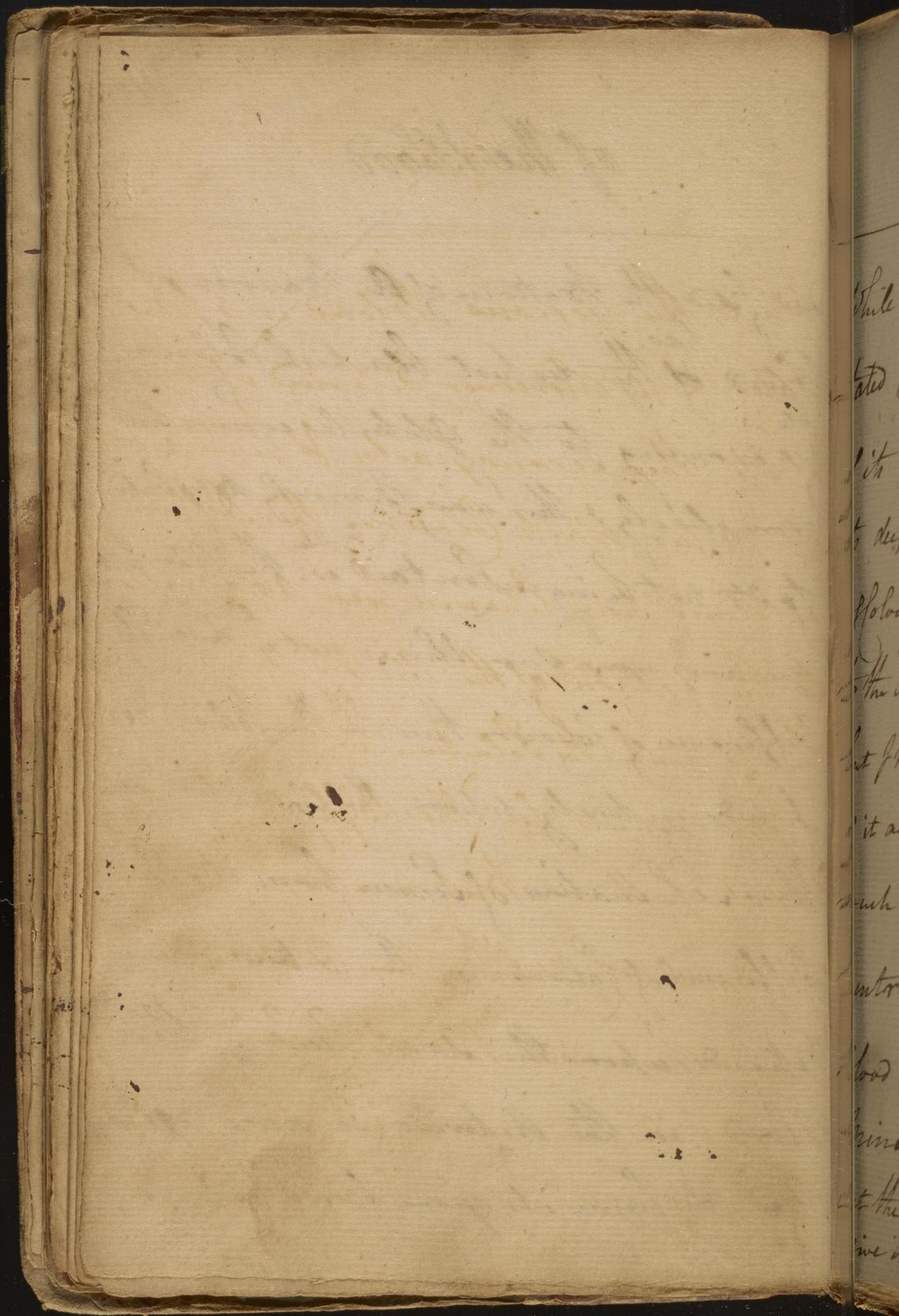
of the Blood

I know of no Experiments that ascer-
tain this, as other parts of the Blood are
so diffused with them. An w: does their
Colour depend? - This is as yet un-
known to ~~us~~ us. Dr Senac imagines
y Colour depends upon 2 or 3 Globules
being laid together each of w: are colour-
less when separate. But here he af-
firms y: the Red Globules are cen-
tricular w: we cannot admit. I grant
indeed the greater or lesser Colour of
the Blood depends upon y Degree of
Concretion in the red Globules. Some



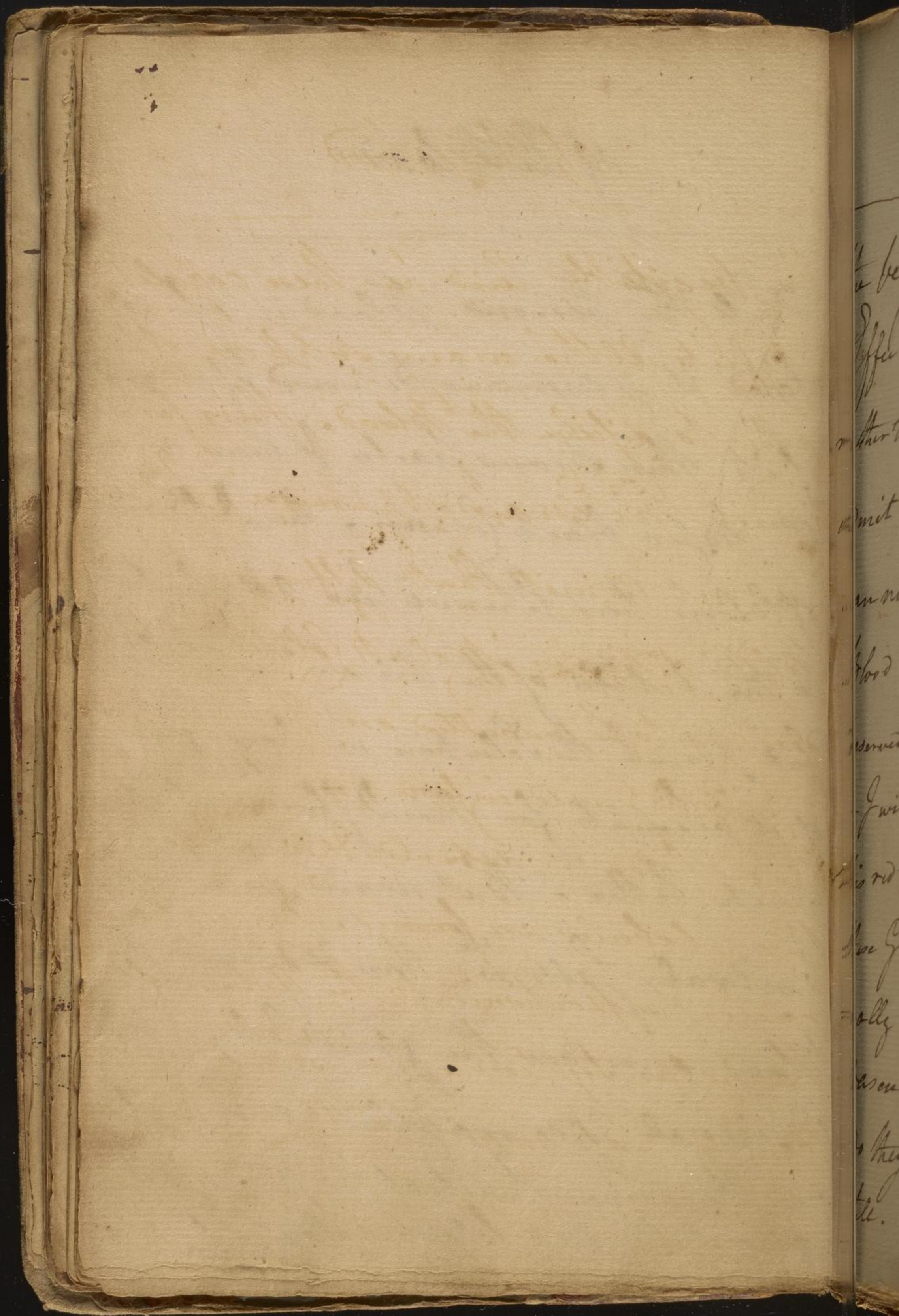
of the Blood

we find the Bottom of a Basin of
 Blood ^{has} the deepest blackish colour
 it is owing to the Globules concreting
 more closely. This was formerly attributed
 to its not being in Contact wth the Air, but
 we are now sure this is not y^e Case. The
 Difference of Colour then in the Blood de-
 pends entirely upon the greater or
 lesser Separation of Serum from it. The
 Difference of Colour in the Arteries & Veins
 depends upon the same Cause. The
 Blood in the Arteries is more agita-
 ted & hence its more florid Colour,



of the Blood

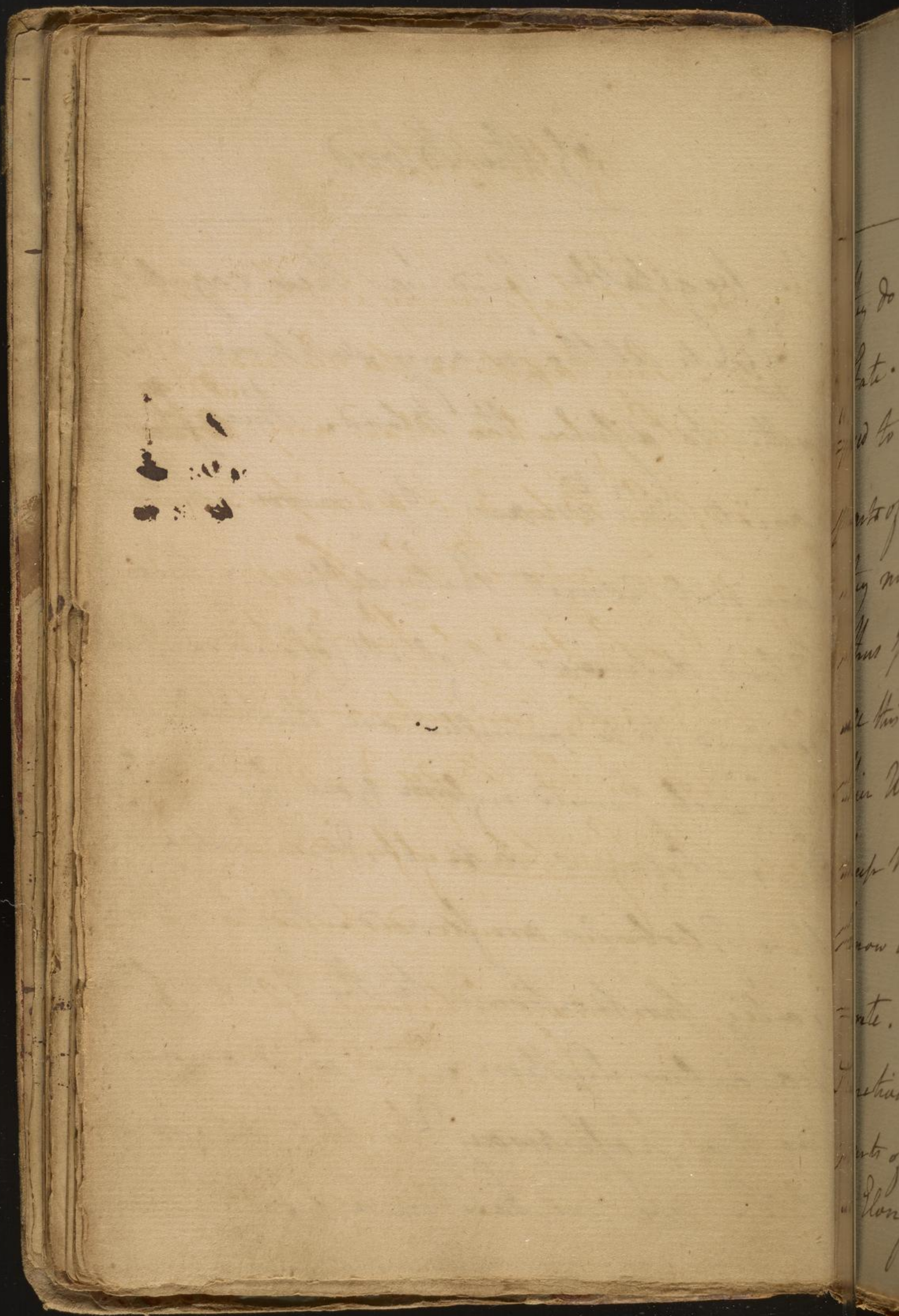
While the venous Blood is less agitated & is moreover deprived of much of its thin serous parts, & hence arises its deeper black Colour. This Difference of Colour has likewise been attributed to the Action of the Air on the Blood, but I think the Solution we have given of it accounts for this Difference of Colour much better. But Again, we know^y that Neutral Salts th thin & dissolve the Blood encrease the florid Colour, while Mineral Acids coagulate it & press out the serous parts of the Blood, & thus give it the deep black Colour. even



of the Blood

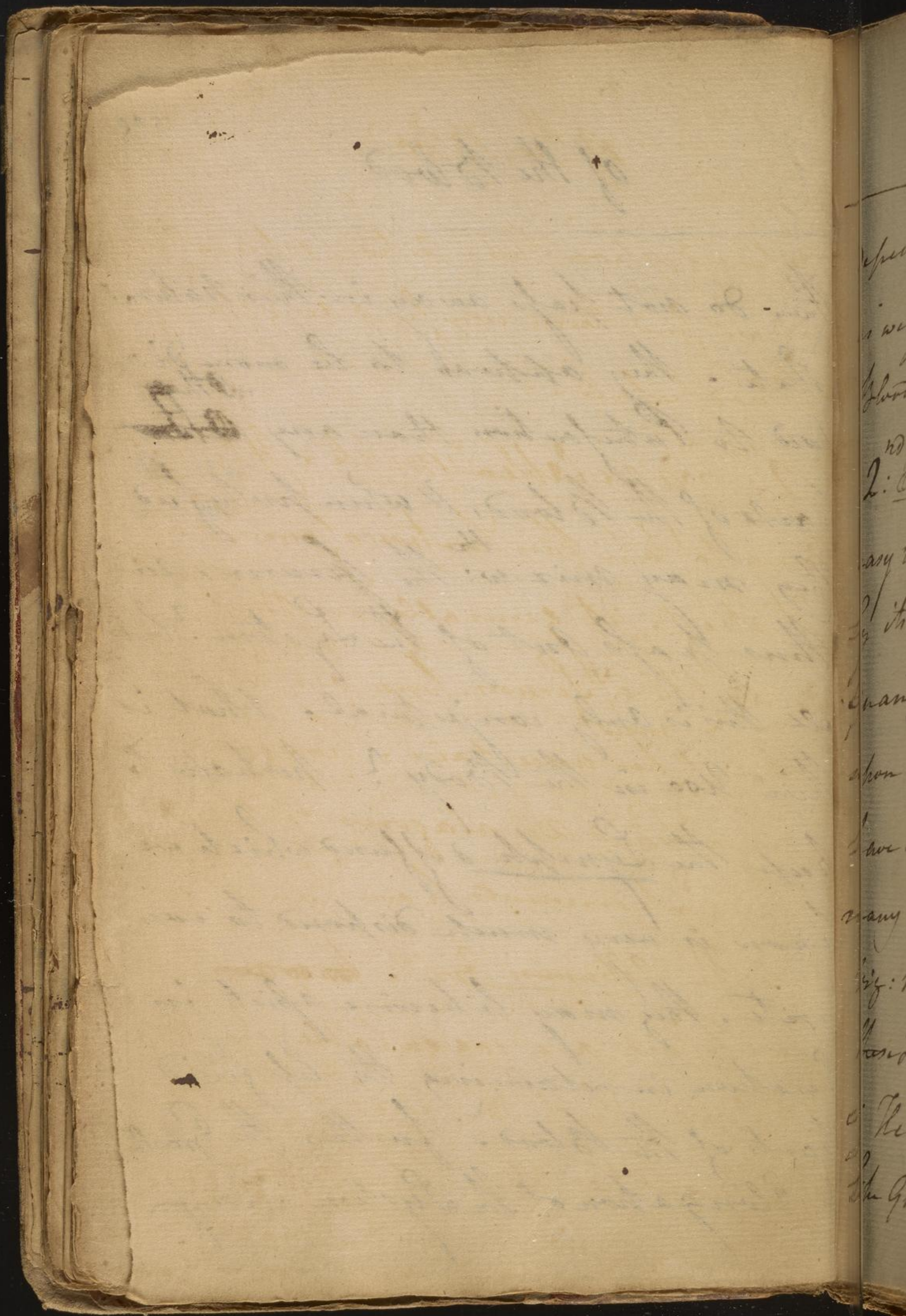
The Vegetable Acid has these coagulating Effects altho' many suppose it tends rather to dissolve the Blood. Thus far we admit M^r Senac's Opinion, but we cannot admit that diffusing the Blood deprives it of its Colour. D. Haller deserved to be consulted on this Subject.

I wish I could inform you from whence this red Colour is derived, & in w^h manner these Globules are formed. They are generally proportioned to the Action of the vascular System. in w^h manner do they pass away? This we cannot tell. we are sure in a healthy Body



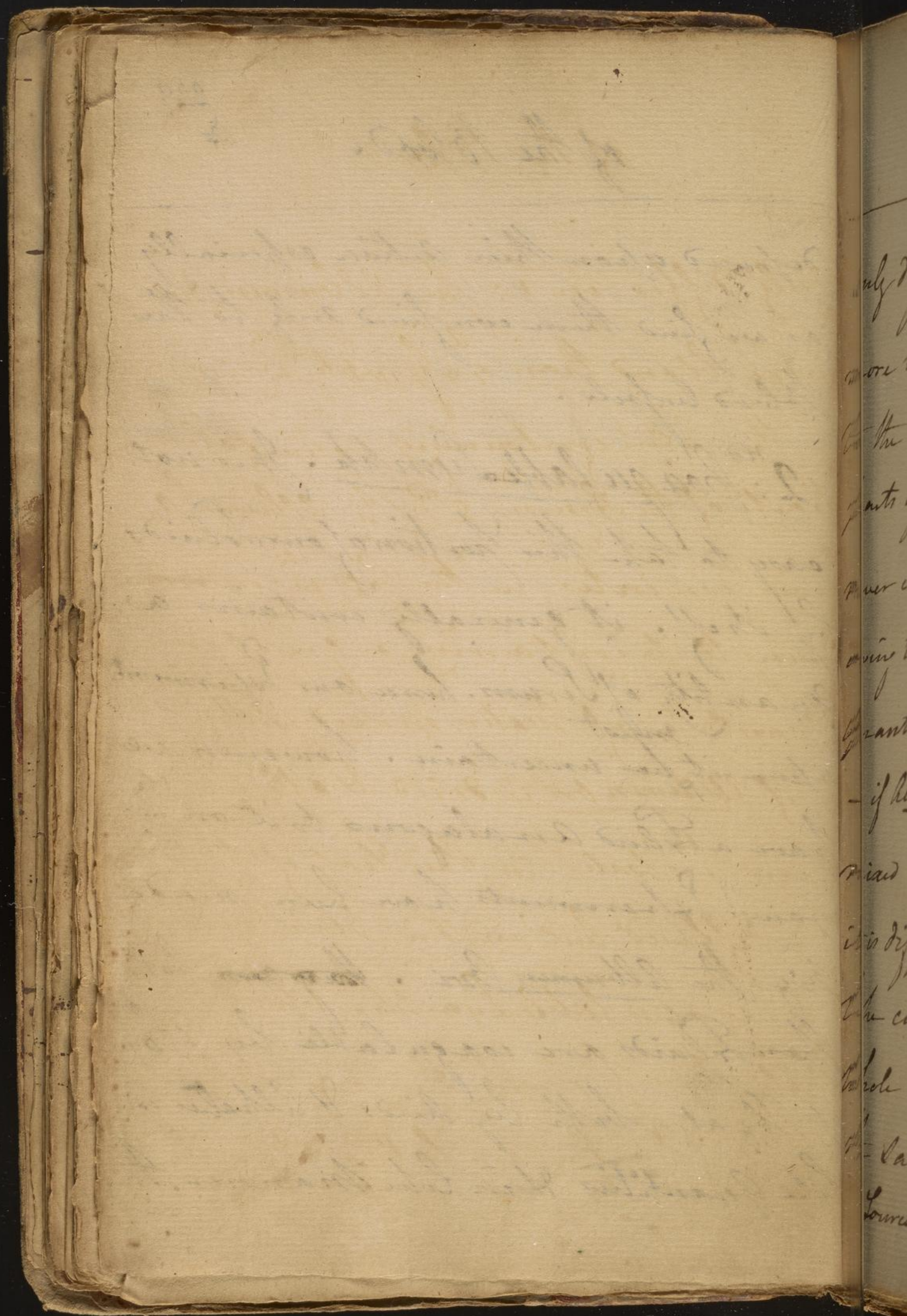
of the Blood

They do not pass away in their natural state. They appear to be more disposed to Putrefaction than any ~~other~~ ^{other} parts of the Blood, & when putrefied they may mix wth the Serum, and thus pass out of the System? but all this is only conjectural. What is their Use in the Body? perhaps to keep the Lymph diffused which we know is very much disposed to coagulate. They may likewise assist in Secretion in retaining the less fluid parts of the Blood. Further the Growth & Elongation of the System may



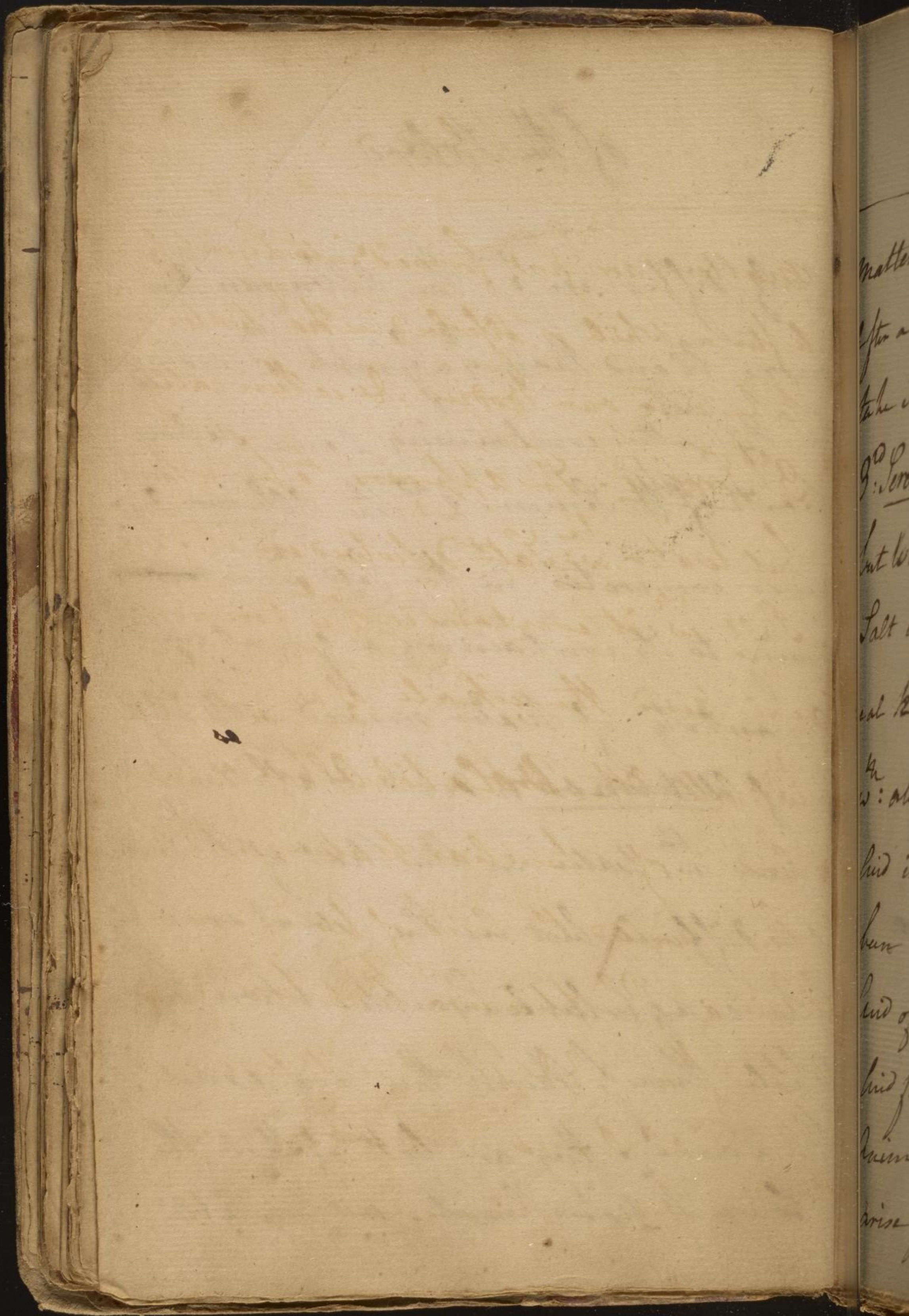
depend upon their action especially
as we find them confined only to the
Blood vessels.

2nd Coagulable Lymph. It is not
easy to take this portion of our Fluids
by itself. it generally contains a
Quantity of Serum. hence our Experiments
upon it ^{must} be uncertain. however we
have a Fluid Analogous to it on w:
many Experiments have been made
viz: the Albumen Ovi. ~~hence~~ both
these Fluids are coagulable by 156:
of Heat - both by acids & alkalis in
like Quantities & in like Manner. They



of the Blood

Only differ in ^{1st}: The Albumen Bri is
 more bland than ^{2^d} Lymph ^{ch} w: is owing
 to the latter containing some saline
 parts of the Serum. 2nd: The Albumen Bri
 never concretes in the Cold ^{ch} w: is ~~never~~
 owing to its containing a greater
 Quantity of water mixed with it.
 - if Albumen bri is dried & afterwards
 mixed th w: water in the Heat of the Body
 it is diffused, but in the Cold it concretes
 like coagulable Lymph. Upon the
 whole then I think they are exactly
 the same. They are both of them the
 Source of nourishment. all vegetable

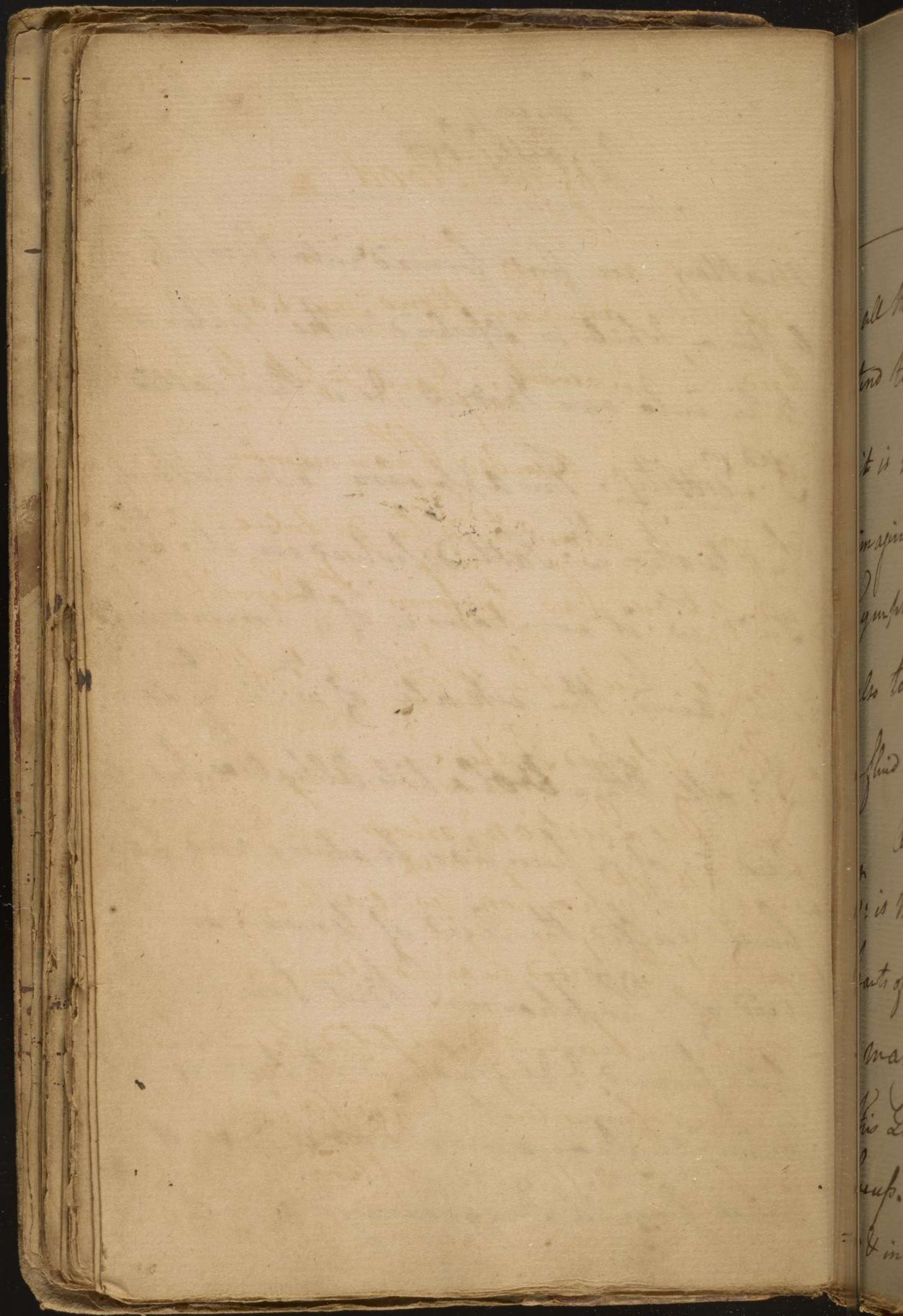


Of the Blood

Matters are first formed into Lymph, ^{ch} w:
 after a while is dissolved in the water we
 take into our Bodies, & is then called

3^d Serosity. This appears to be nothing
 but water w:th Salt dissolved in it. This
 Salt w:^{ch} it contains is of y^e ammoniacal
 kind, the alkali of w:^{ch} is y^e same

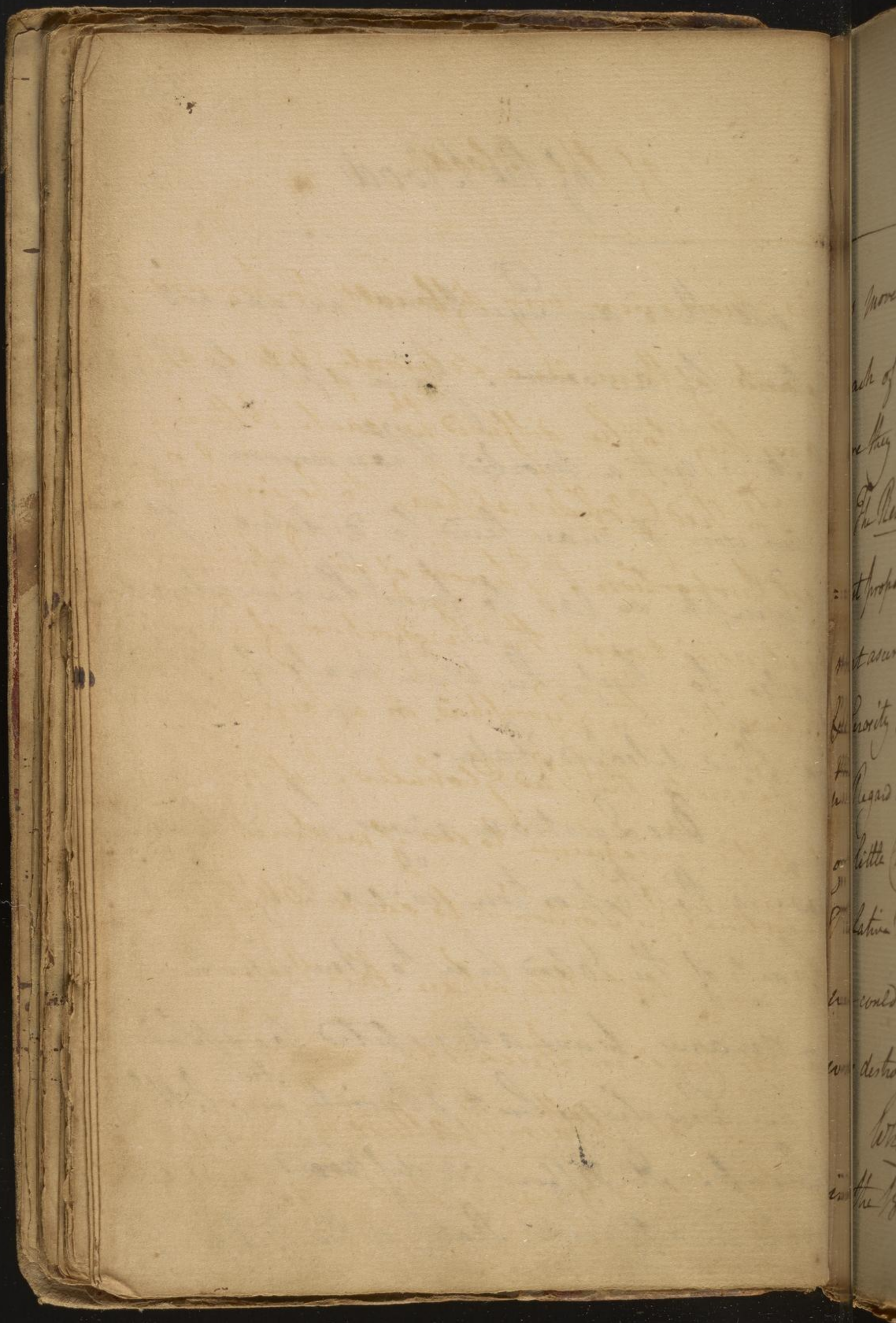
w:th all other Volatile Alkalies, but its
 acid is of a peculiar nature, and has
 been called the acid of Urine, or the
 Acid of Phosphorus. But how is this
 acid formed, & what is its use in y^e
 Animal Economy? & ~~how~~ does it
 arise from a Degeneracy of our Food?



of the Blood

all these are Questions we cannot pretend to answer. I am apt to think it is not a morbid Phenomenon. I imagine it may tend to dissolve the Lymph so as to form the Leucity, as also to keep the whole Mass of Blood in a fluid dissolved State.

One Question arises here & that is ^{is} what is the Proportion ⁱⁿ each of these parts of the Blood bear to one another? - many have attempted to explain this Question but I think wth little Success. It differs in different Constitutions & in different States of the Body. It



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of the Blood

is moreover very difficult to procure
each of them in a separate state so apt
are they to be diffused wth each Other. See

The Red Globules appear to be in $\frac{1}{4}$ ² Smal.
-est proportion. I know of no Experiments
that ascertain the proportion of $\frac{1}{4}$ ² Lymph
& Serosity. The Lymph is in a large Proportion.
th wth regard to the Red Globules. it would be
of little consequence to us if we knew their
Relative Proportions to each Other, as
we could not tell when this Proportion
was destroyed in Diseases.

What Other Matters are contained
in the Blood? Some suppose the

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Chyle ought to be considered as a part of the blood. But the evidences of Presence of this Chyle in the blood are not satisfactory. The Notion of its prevailing in the blood arose entirely from an Ignorance of the nature of the blood. Coagulable Lymph has I believe been mistook for it. I will still however allow that Chyle may be present in our blood altho' it is not observed by our Lenses. But of this we shall speak more hereafter when we treat on $\frac{2}{3}$ milk.

Our Fluids ^{ch} circulate in the blood: vessels may be divided in 5. parts

1 Aliment not quite assimilated

2 Albumen, or coagulable Lymph.

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3 Albumen tending towards Serosity.

4th Serosity, strictly so called.

5 Red Globules.

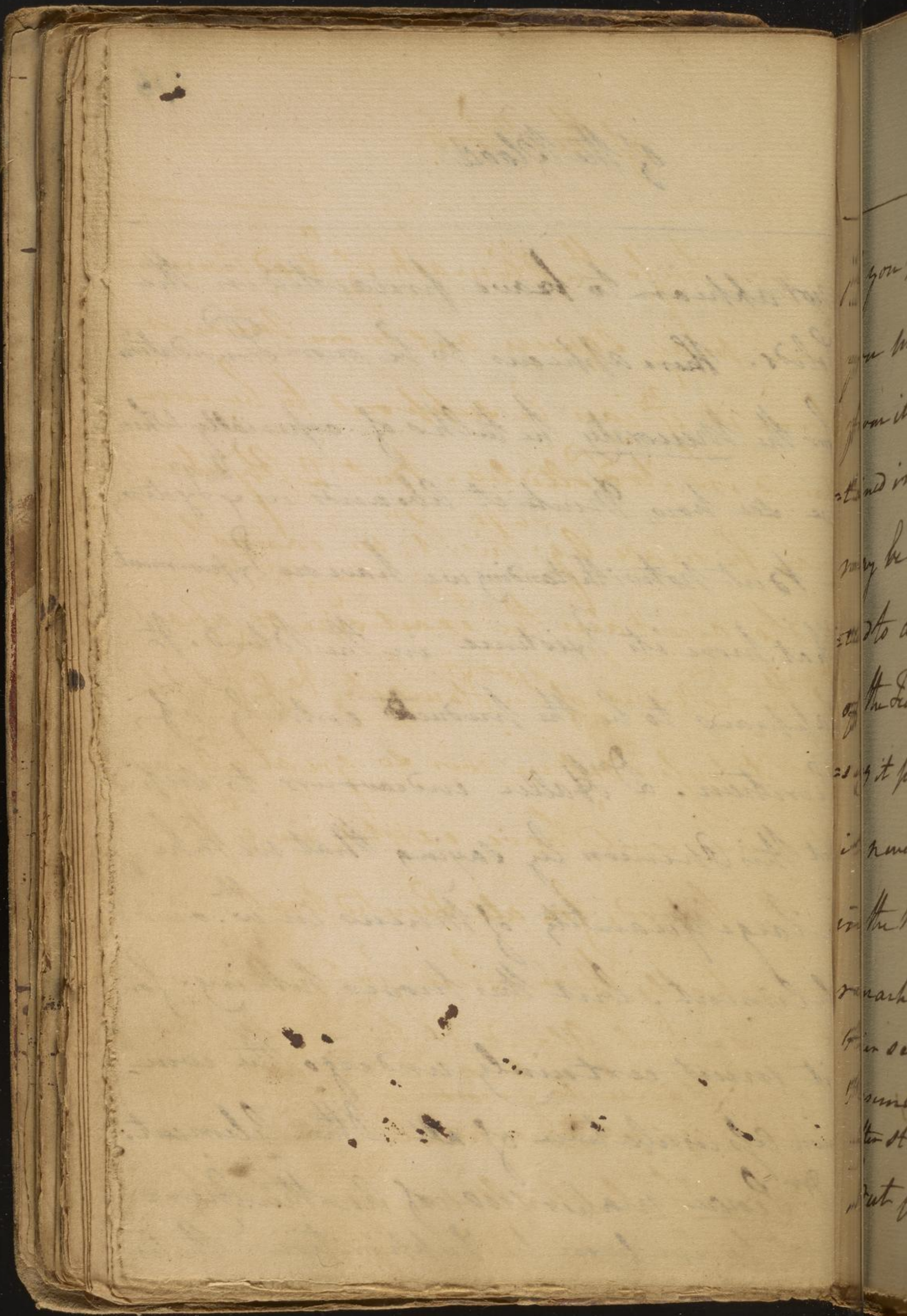
To these 5 parts Dr. Linae adds 2 more. viz
 a Gelatinous & Mucous Part. But I know
 of no Experiments that show us any
 thing like a Gelatinous Matter in the Blood.
 - I therefore conclude he infers its Existence
 only from Theory, viz: ^{From} the Nature of the
 Solids ^{ch} w: are gelatinous when resolved, &
^{ch} w: are formed from the Blood. Besides
 even the Gelatinous Matter of our
 Solids is proved only by a decomposition
 of their constituent parts, & does

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238

of the Blood

not appear to have prevailed in the Solids. There appears to be more Foundation for the Memority he talks of, especially when we see how much it abounds in ^{the} System, - But notwithstanding we have no Experiments that prove its Existence in the Blood. It appears to be the product entirely of Secretion. Dr. Haller endeavours to support this Opinion by saying that we take a large Quantity of Mucus in ^{the} our Aliment. but this proves nothing. for it must certainly undergo the common Assimilation of all other Aliment. Dr. Ferrius makes use of another Argument to confirm his Supposition. That is,



If you press the Stomach of ^a dead Animal
you may squeeze out more Mucus
from it ² can be supposed to be con-
tained in its Follicles. but 2 Objections
may be made ag: ¹ this. 1: we cannot pre-
tend to ascertain the exact Size or Capacity
of the Follicles of the Stomach & 2nd Suppo-
sing it pressed out in ever so great a Quantity
it never could have existed in ^{the} ^{same} state
in the Blood, for all Secreted Matters are
remarkably thin when first poured into
their several Glands, & have scarce any
Resemblance to ^{the} ^{form} in w: they appear
after stagnating a while.

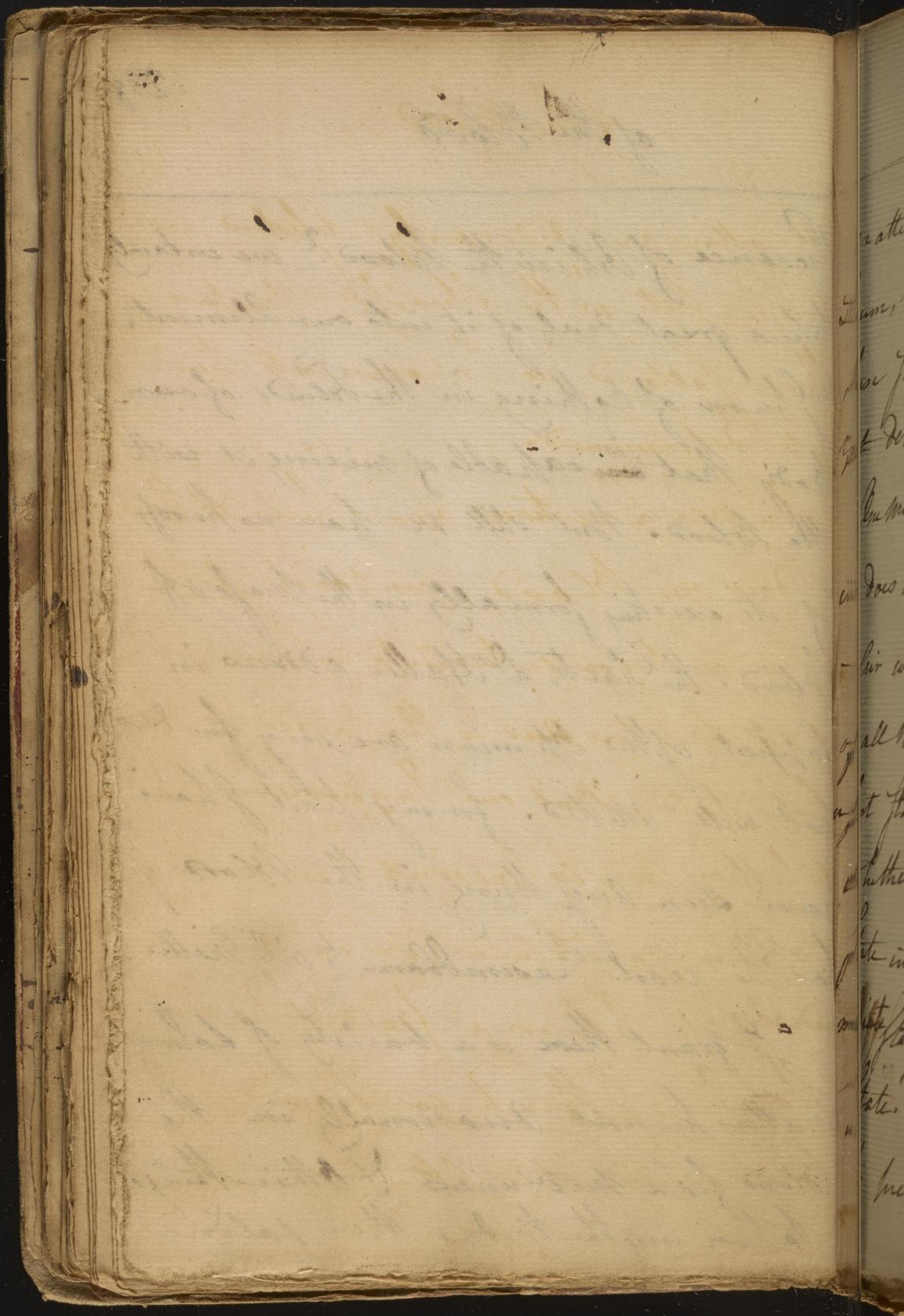
But what shall we say to the

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Presence of Oil in the Blood? we certainly
take a great deal of it into our Aliment,
& know of nothing in the Fluids of our
body that ~~is~~ ^{is} capable of mixing it with
the blood. But still we have no proof
of its existing formally in the Mass of
Blood. The Facts Dr Haller adduces in
Support of this Opinion are very few & are
not well attested. for my part I have
never seen any thing in the Blood y.
had the least Resemblance to oily Matter.

- I grant there is a variety of saline
Matters present occasionally in the
Blood from Medicines & other things
taken into the body. These saline



Matters are ordinarily dissolved in $\frac{1}{2}$ Serum, but wth the specific nature of these facts is no Experiments have yet determined.

One more Question occurs here, & that is, does our Blood contain Air?

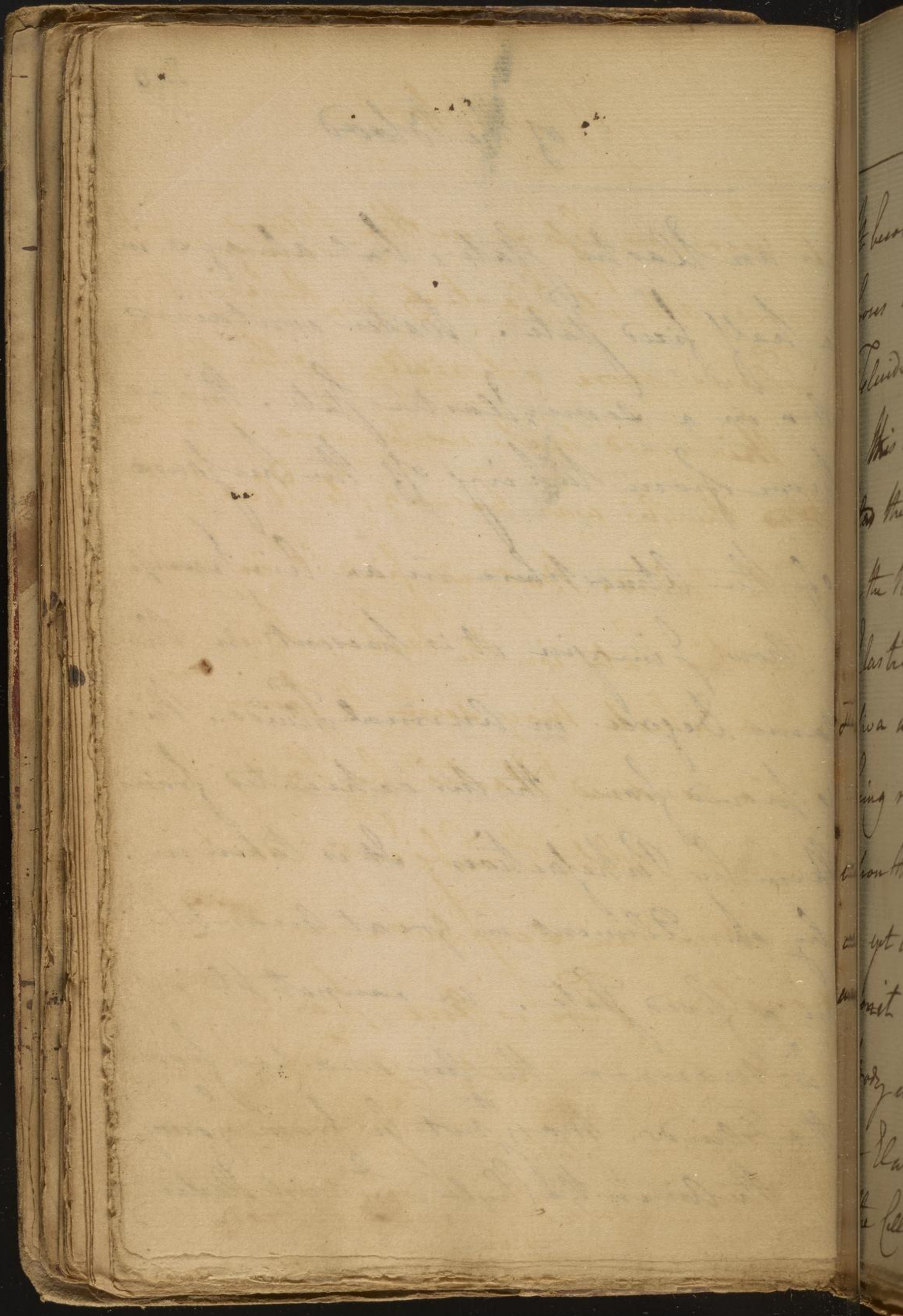
Air we know enters into $\frac{1}{2}$ Composition of all Bodies, and is then said to be in a fixed state. But our Inquiry here is whether Air is present in an Elastic state in our Fluids, or in an intermediate state between a fixed & Elastic state? - I think we have Reason to presume it is often present in

[Faint, illegible handwriting on aged paper, likely bleed-through from the reverse side.]

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of the Blood

in an Elastic state, but always in a half fixed state. Water contains air in a semi-Elastic state. This we prove from taking off the pressure of the Atmosphere in an Air pump. Now I imagine it is present in the same Degree in Animal Fluids. This is proved from the air extricated from them by Putrefaction. It is taken in by our Aliment in great Quantities in a fixed state. we cannot tell in what manner the air escapes from the Fluids. May ^{it} not be from the Lungs? — The air in the Chyle is of most Elastic.



of the Blood.

241

It becomes less so in the Blood, but
loses all its Elasticity in ^{some of} the secreted
Fluids more especially in the Urine.
This would make us believe that ~~as~~
~~the~~ the Air was losing its Elasticity
in the Blood. But we find it in an
Elastic state in the Milk - Bile - and
Saliva which may seem to favour its
being rendered Elastic by the Lysium.
Upon the whole, the Subject is dark, &
as yet we can say nothing precise
upon it. There is one part of the
Body ⁱⁿ which seems to contain Air in
an Elastic state necessarily, viz
the cellular membrane. This is proved

+ 565

from Emphysema's. M^r. Senar says
air is to be found in every cellular
membrane in the body. I think it
appears to be highly⁺ probable that
there is a secretion of this air from
our fluids ^{or} is poured out in the
cellular membrane, & that many
Diseases not yet described may arise
from a Separation or a want of a
due secretion of air. This then finishes
our Acc^t of the blood, or circulating
fluid. All the other fluids of
body are formed from them by organs
provided for that purpose. This function

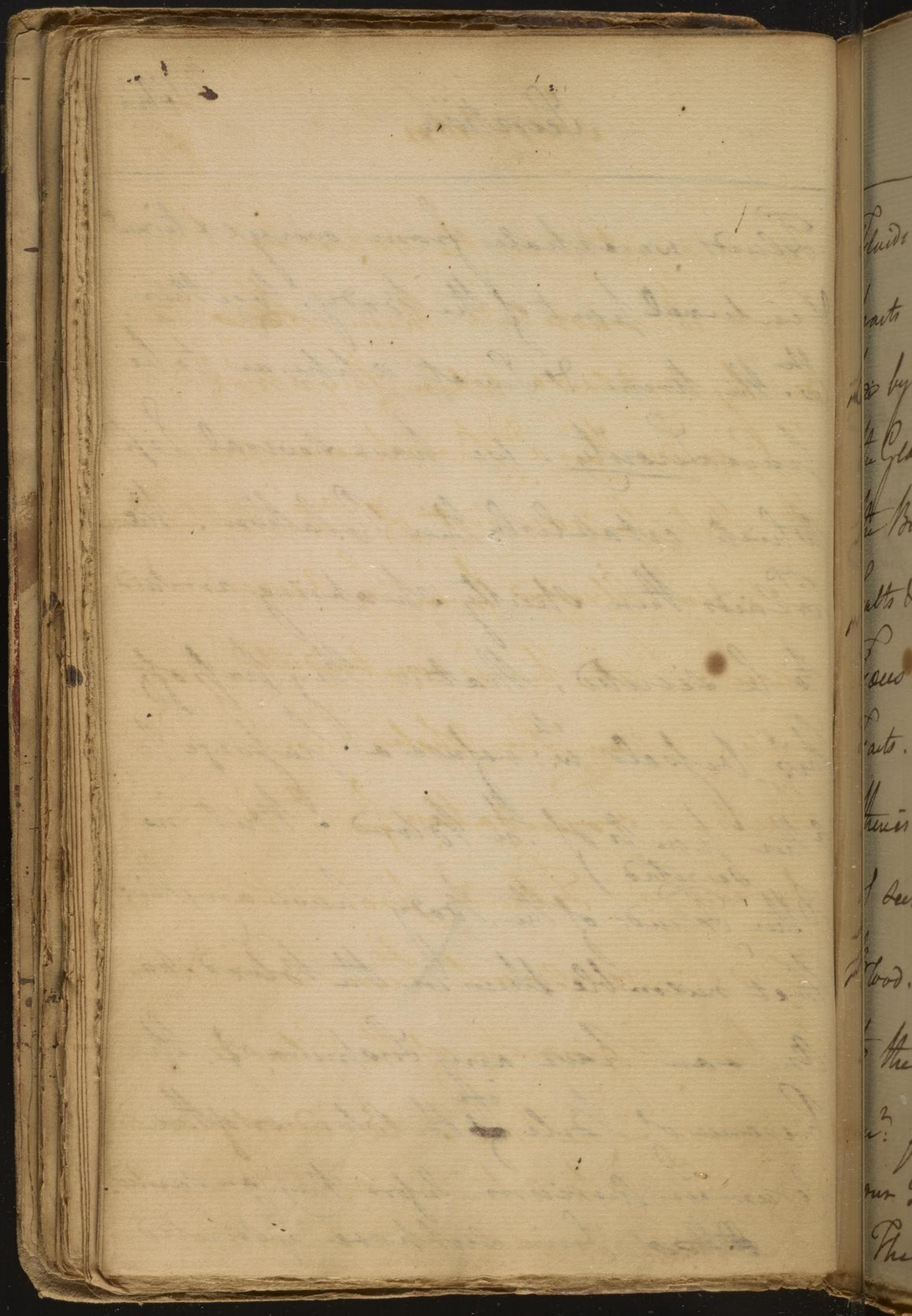
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is called Secretion which appears to be the most considerable Function of the Animal Economy, and I am sorry to add One that we understand least about. By Secretion we understand Fluids prepared from a heterogeneous mass of Fluids by a kind of Colation. — a Question occurs here in the first place &c. did the secreted Fluid preexist before in the blood? or are they formed by a new mixture? as to the first of these we have sufficiently rejected it when considering the constituent parts of the blood. thus far we may allow it to be true, that the

This image shows a blank, aged, cream-colored page from a book. The paper has a slightly textured appearance with some minor discoloration and faint, illegible handwriting visible through the paper. The page is bound on the left side, and the right edge shows the binding of the adjacent page. There are some small dark spots and a larger brownish stain near the bottom center of the page. The overall tone is warm and historical.

Fluids we exhale from every external
& internal part of the body, together
^{the} w: the Urine & Sweat appear to be
pure Liquor. we have several Spi:
which establish this Relation. These
Fluids then strictly speaking are said
to be secreted, that is they pass off
tho vessels w: refuse a passage to
other parts of the Blood! But no
other ^{secreted} Fluids of the Body have anything
that resemble them in the Blood. No
One can have any Suspicion of the
Presence of Bile ⁱⁿ the Blood or of the
Crumen Aurium before they are secreted.
- ~~Other~~ Some suppose y secreted



Secretion

245

Fluids exist in the Blood in those parts ^{wh} constitute them. ~~And the~~ ^{are} by mixture when they arrived at the Glands. Thus Dr Boerhaave makes the Bile to consist of bil. alkaline Salts &c absorbed from ^{the} Alimentum & Lues. But this is contradicted by many Facts. upon the whole then conclude there is no Foundation for ^{the} Opinion of secreted Fluids preexisting in the Blood. We must then look ~~for~~ to the Origination of the Glands to en^d for Secretion. We must reduce our Fluids to 2 kinds i Bily & Watery. The watery parts of our Fluids may

121 This is remarkable in $\frac{1}{2}$ Blood
in an Ischaemia Renalis, in w:
Disease even $\frac{1}{2}$ pores have poured
out Urine.

Secretion

be divided into 1st Lymph 2nd Mucus
3rd Such as are impregnated wth saline
matter viz: Urine & Perspiration.

The Bily matters are more difficultly divided.
— Perhaps the Milk may arise from it.

— But I cannot conceive of Bile or of
Cereumen & Cerium arising from ~~the~~ it.
we must then resolve their Formation
to the Nature of the Secreting Organs.
we have no Observations y^t show us the
Presence of Bile in the Blood in an
Obstruction of the Secretion from
Spissority. or Inflammation. we
must then allow that it is formed
in y^e secretory Organ itself. we see

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Secretion

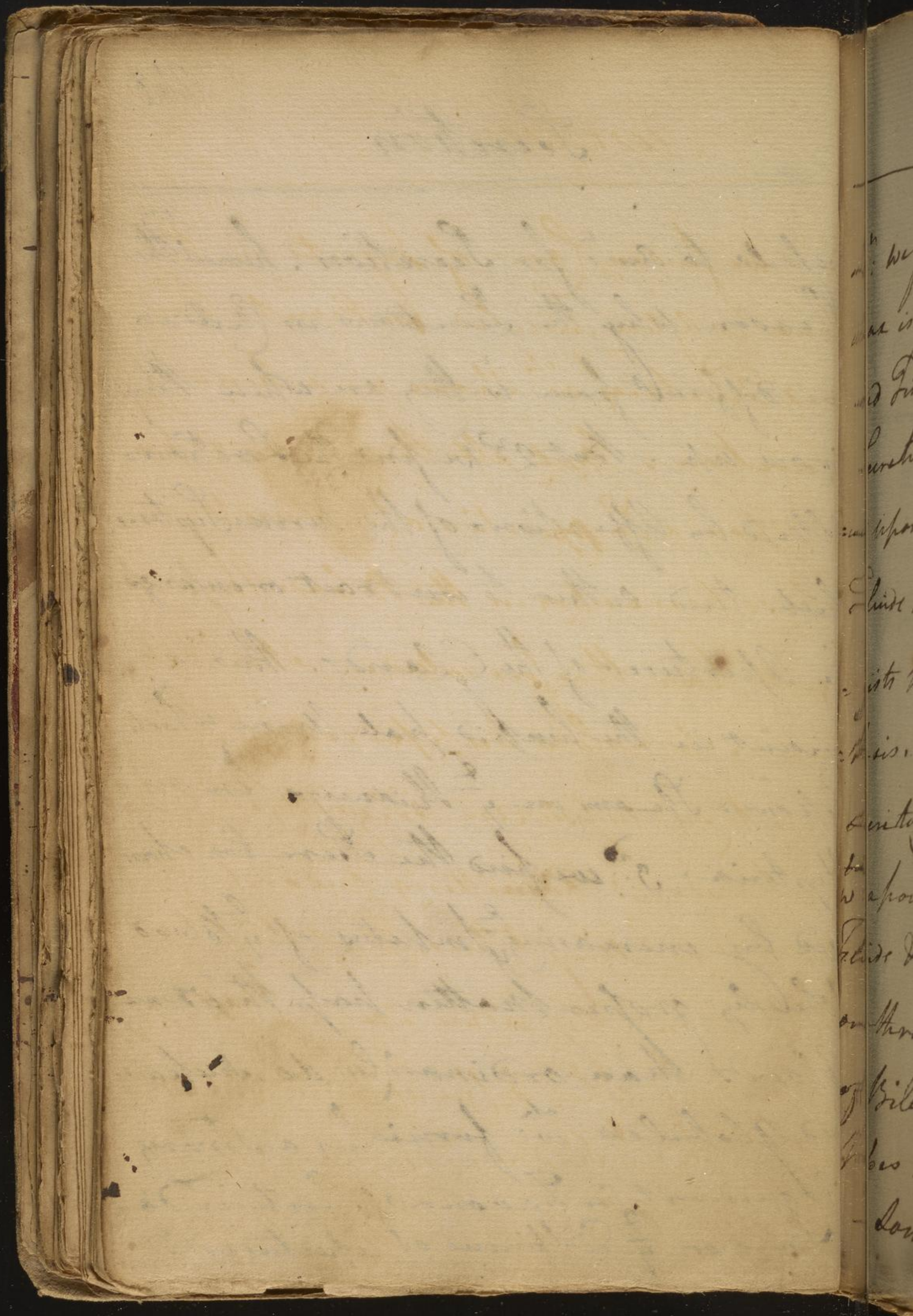
Something analogous to this in Plants
^{ca} w: from one general Fluid are capable
 of secreting 4 or 5 different Juices. w:
 is the nature of the secretory Organs
^h y: gives them the power of forming
 such Fluids? - This is a most difficult
 Question. Some of the Glands consist of
 a Series of decreasing vessels. Others have
 Follicles interposed between ^e y secretory
 & excretory vessels. But we must attend
 to the first structure only in accounting
 for Secretion, for the Fluids are always
 secreted before they are poured into
 the Follicles. Shall we call in y:
 Difficence of Aperture to ~~be~~ ^{indere-}
 -tory

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Secretion

refers to an^d for Secretion. hence the
 Reason why the Secretions in Children
 are different from w^h they are when they
 grow up. But 2nd we find the Secretions
 altered by Affections of the Nervous System
 which tend either to contract or enlarge
 the Apertures of the Glands. This is
 evident in the limpid pale Urine which
 follows a Spasm on y^e Kidneys in an
 Hysteria. 3rd we find the Secretion chan-
 ged by increasing Intake of y^e Blood
 whereby proper matter has more
 Glands than ordinarily do. such as
 red Globules w^h furnish a strong
 Argument in favour of Secretion de-
 pending on y^e Diffuse of Apertures.



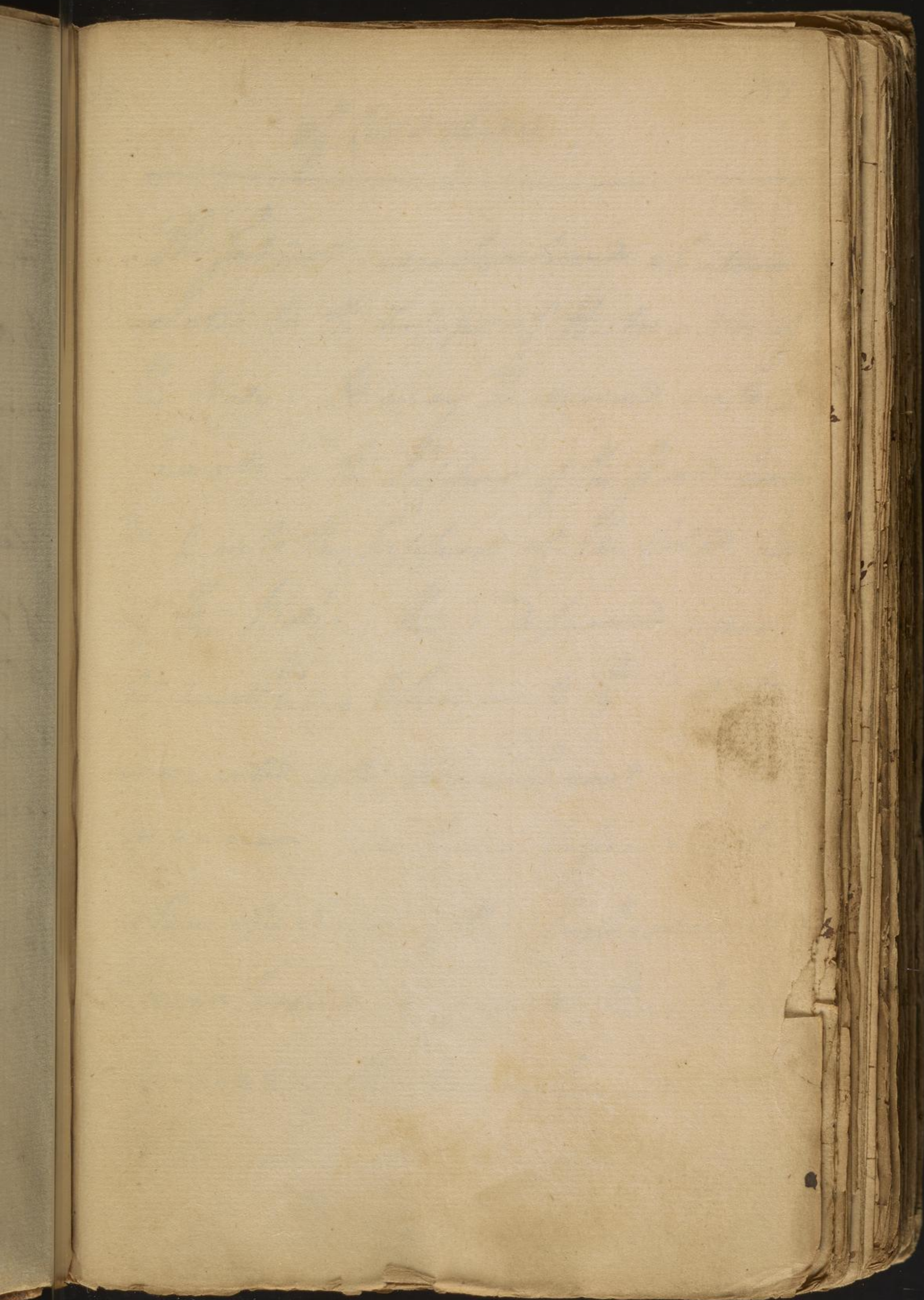
2^d: we find in Cases of Injections the
Wax is often injected without the
red Tincture ^{ch} w: shows us a kind of
Secretion. But all these Arguments pro-
ceed upon a Supposition of ² secretory
Fluids preexisting in the Blood. Physiolo-
gists have therefore called in Other Hypo-
thesis. Winslow supposes ² y: the
secretory vessels are originally endowed
th w: a power of admitting one sort of
Fluids & repelling Others, but this is
overthrown by w: we see in y Case:
of Bile ^{ch} w: when diffused in y Blood
passes thro y Kidney, Salivary Glands &c.
- Some Other powers of Mixture &

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Secretion

Fermentation must be called in
to aid: for Secretion as well as the
mere Structure of the Glands, especially
in those cases where Follicles take
place. Altho' we have no Instances
of Fermentation in a healthy Body
yet we have in the diseased. Pus
appears to be formed from Serum
secreted from the Blood ^{which} is afterwards
changed by a Fermentation *Sui*
Generis. — See Mr. Gaber's
Experiments.



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of Nutrition.

This subject comprehends whatever relates to the Support of the Matter of the Body. It may be divided into 2 parts: 1st the Support of the fluid parts & 2nd into the support of the solid parts of the Body. The 1st depends upon Aliment being taken in to the Body & converted into nourishment in the manner we have before described when speaking of the Cylopoesis & Hemapoesis. I shall therefore only speak of the nourishment of the Solids. we shall enquire what part of the Fluids are applied to

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Nutrition

Nourish~~ment~~ the solids, & in what manner.

- This Inquiry again divides itself into 2 parts 1st how Growth is promoted & 2nd how a waste of the solid parts is repaired after the Growth has ceased.

- I shall begin wth the 1st Question in w^h manner the Solids are applied so as to give Growth to the Body. you see how much this Question is connected wth the Organization of all animal & vegetable Bodies in general. But as this subject admits of no Application in ~~Physic~~ I shall pass over it. I only observe that I adopt the Doctrine of Stamina w^{ch}

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Nutrition

evident
appears from the Body in its Growth
showing marks of an evolution of
parts previously delimited. Altho'
the Stamina of some parts of the Body did
not exist such as the nails yet such
a Nature is originally given to the parts
contiguous to these parts if did not exist
as to determine precisely the Form of all
matter applied to it. see this subject
more fully discussed by Dr. Haller.

I shall consider Nutrition in the
following manner.

- 1st What is the proper Nutritious Fluid?
- 2nd Where this Fluid is separated
from the Blood?
- 3rd In what manner is it thus separated & how
conveyed to the smallest Fibres everywhere.

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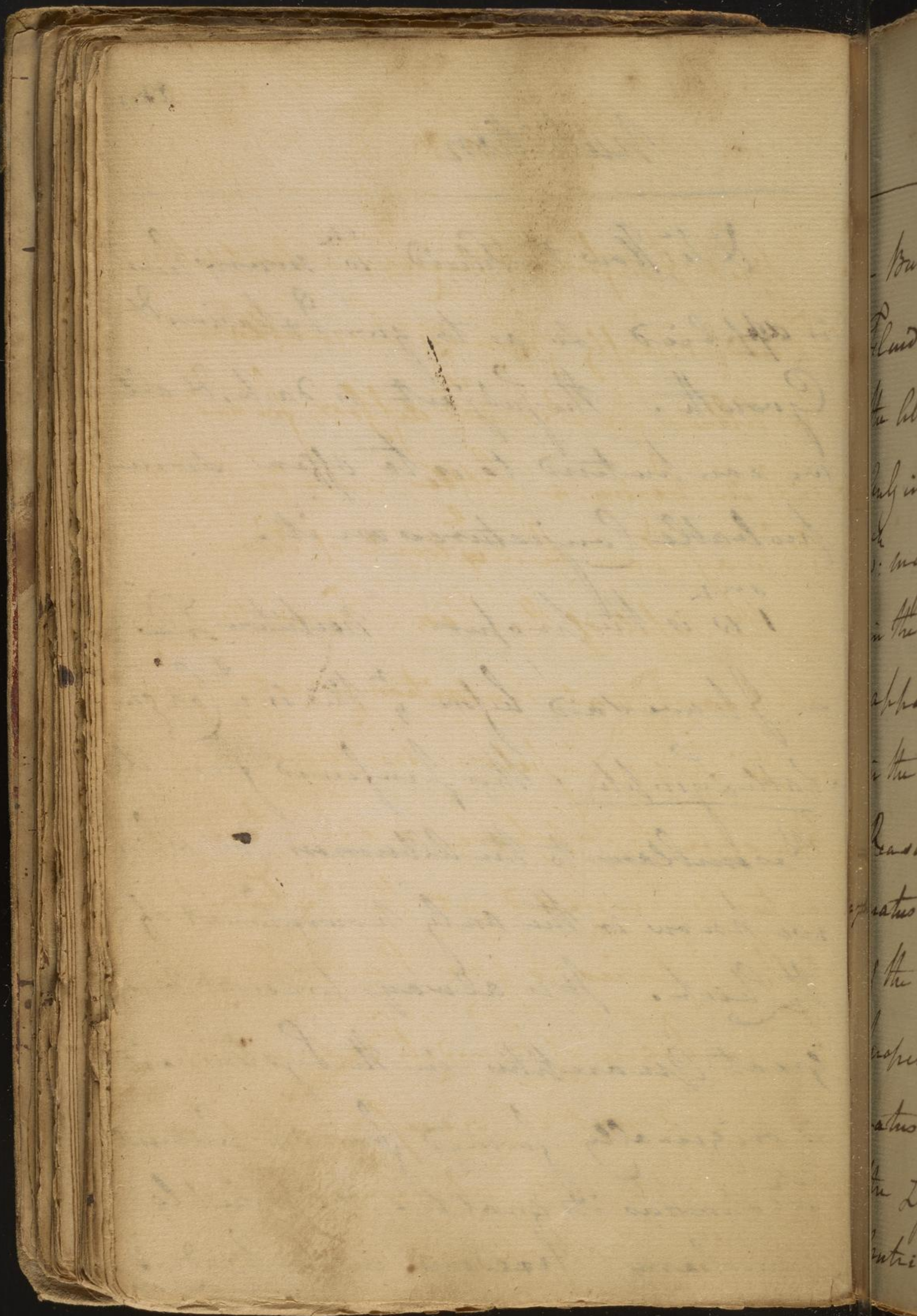
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Nutrition

Qth: How the Fluid ^{is} nourishes
is applied so as to give Extension &
Growth. The subject is dark, & all
we can pretend to is, to offer some
probable Conjectures on it.

Qth: Is the proper Nutrition Fluid?

— I have said before, ² this is ² Coagu-
-lable Lymph. This I infered from its
Resemblance to the Albumenovi which
we know is the only nourishment of
the Chick. It is always present & in
great Quantities in the System. it
is originally formed from our Aliment
^{is} shows its great use, & absolutely
necessary presence in the body.



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Nutrition

- But I infer its being the nutritious Fluid chiefly from its Resemblance to the Albumen Ovi ⁱⁿ w: differs from it only in being a little more Fluid & w: may have been ^{the} work of Secretion in the vessels of the Ren. From this it appears that Nutrition is not performed in the larger vessels, nor have we any Reason to suppose a secretory Apparatus is provided at the Extremities of the Arteries to give the Lymph a proper Degree of Fluidity. Some Apparatus I grant is necessary to change the Lymph into Albumen or proper Nutritious Matter. This many Physiologists

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Nutrition

have supposed is performed in the cortical part of the Brain, & hence they have supposed the nerves to be the Excretories of this nutritious Fluid when secreted, to all parts of the body. see this enunciated more fully in Dr Boerhaave's Institutes § 440 - & 446.

- This Doctrine has prevailed for near 150 years in the Schools of Physic. Dr Haller is the first Who has opposed it. we shall briefly retail his Objection to it, as I am inclined to embrace Dr. Boerhaave's Opinion, - my ^{own} Argument in Support of Dr Boerhaave's Opinion is 1st the Brain is a Gland & 2^d the nerves are its excretories.

121 The first thing observed in an
Embryo by a microscope is the
Brain & medullary Lobes.

Nutrition

- The structure of the Brain is evidently ^{the} a Gland of the Receptian structure. but I shall rest my Opinion upon other more substantial proofs. 2nd Dr. Boerhaave has proved y^e an Inelastic Fluid is secreted in the Brain, now we before proved it could not be designed for Luse and Motion. it must then be deigned to nourish the Body. 3rd the Nerves are the original Stamina of an Animal Body ^{has} & all nourishment is applied to these Stamina, from w^{ch} it follows y^e the Brain & Nerves are necessarily employed in Nutrition. 4th Every part of the Body appears to have been either Fibrous

as Dr Haller tells us y^e: upon macerating
 the veins they appeared to be cellular
 but he forgets y^e: maceration may
 have destroyed their texture. Dr Haller
 himself confesses y^e: the bones are formed
 from fibrous Stamina. this is to intend
 that it may be seen in y^e Cranium.

- if it ever disappears it is owing
 to matter being effused w^{ch}: obliterates
 the fibrous structure: the Tendon

or cellular originally. the Cellular
parts appear to be formed by an
After Accretion. this is sometimes evi-
dent to our Eyes. & is proved from the
Phenomena of many Diseases. It is always
in a determined Quantity in all Animals
of the same Species. this only can depend
upon Haminal Fibres directing its
Arrangement. But w^h shall we say to
the veins? they have some t^h up no
Fibres but are cellular¹⁴¹. but negative
proof avail nothing. we find a Fibrous
Structure in the Dura Mater^{ch} w^h is capa-
ble of forming²⁷⁷ a Cellular appearance
from w^h it appears highly probable y^t
the veins are Originally Fibrous.

we know were ~~and~~ muscular, & were
possessed of Sensibility & Irritability but
by age loses them both together with
their fibrous appearance, yet surely
no one will deny their being originally
Fibrous.

Nutrition

This answers the first & 2nd Questions we proposed & in some measure the 3rd for if it is secreted in the Brain it is highly probable it is conveyed to all parts of the body by the nerves. But I go on wth the Arguments I began with. 5th The only Fibrous parts of the body we observe are the nerves. no one I think has denied their fibrous structure. They all terminate in muscles w^{ch} I formerly said were always Fibrous. Dr Haller supposes that the Growth & Extension of the body together wth the evolution of the Lamina depends upon the action of the Heart & Arteries. But the

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Nutrition

Action of a Brain & a Nervous System
 is absolutely necessary to account for
 the first Action of the Heart & Vessels.
 — There are late Observations by one
 M. Lion^e w^h show us that ~~the~~ Animals
 are originally in a vegetable state. ^{the}
 first thing w^h evolves the Germen of
 Plants is Heat, & we can best com-
 prehend the Operation of Heat first on
 a nervous System. The nourishment
 of Vegetables depends on a nervous System
 they contain of Fibres distributed
 in an Analogous Manner to the
 Distribution of Nerves in an Animal
 Body. It is no matter how whether they

(as by Injection here we are to un-
derstand coloured Liquor so placed
in the Roots of Plants that they absorb
it.

251

Nutrition

Fibres are tubular or spongy. This does not affect our Question. These Fibres do not ramify, but proceed in straight Lines like nerves. They have lately been injected by colour'd Liquors, which always appeared in distinct separate Lines. When they appear to ramify they only split into lesser Fasciculi. Moreover by maceration they always separate into distinct Fibres. upon the whole ^{no} ~~any~~ Observation shows us ^{an} Analogy between the nerves of plants and the vessels of Animals. we have

[Faint, illegible handwriting in a cursive script, likely from the 18th or 19th century. The text is spread across approximately 15 lines on a single page.]

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no Observations that tend to show any analogy between the blood vessels of animals & the vessels of Plants.

all Plants spring from Original Stamina which may be seen by opening a Gougeon more especially their Leaves. But I return to apply this to our present subject. Every Year there are Layers accreted to the Tree from ^{the} internal surface of the bark. This is proved by cutting a piece of Bark out of a Tree & ^{fixing} ~~putting~~ a piece of tin plate ^{shutting} over it, & then ~~putting~~ the Bark over it again, & tying it closely to the Tree. if we examine this tin plate some years

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Nutrition

263

Afterwards we shall find it sunk pretty deep into ^{the} substance of the Tree.

If we examine the internal structure of the Bark of Trees we always find it Fibrous. all the Cordage used in Ship Building is procured from this part of Vegetables. Every Year the Tree receives a Layer of Fibres from the Bark which may ^{be} seen in the Spring of the Year. I grant there may

be a great accession of cellular substance to ~~the~~ Trees as in the Fruit, but

this arises from Original Stamina.

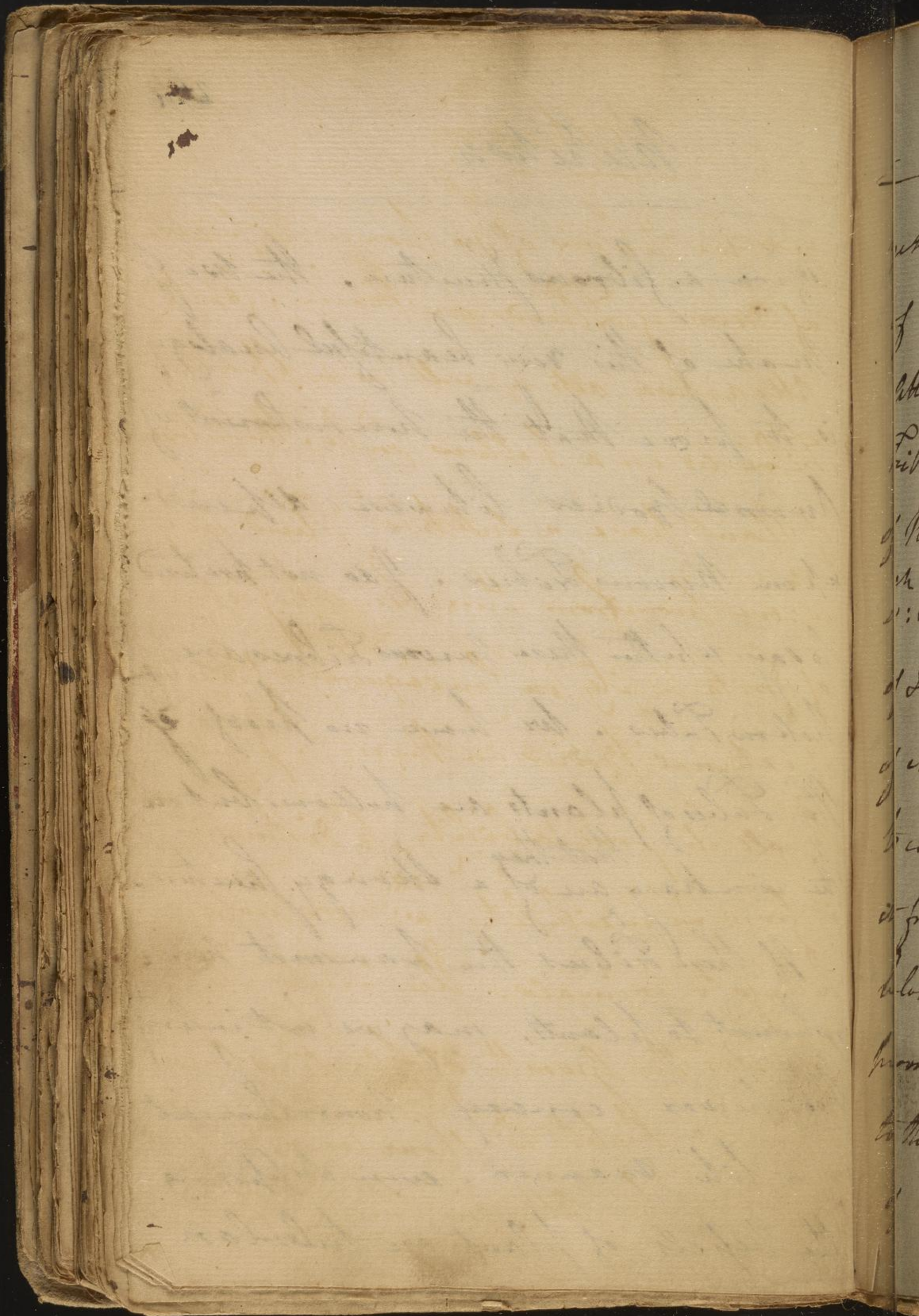
From all ^{this} I conclude the Form & Growth of Plants depends entirely

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254

Nutrition.

upon a fibrous structure. The use of
make of this very beautiful analogy
is to prove that the nourishment of
Animal bodies likewise depends
upon Nervous Fibres. I do not pretend
to say whether these Nervous Fibres are
hollow Tubes. We have no proof ⁺ if
the Tubes of plants are hollow, but on
the contrary ^{that they} are of a spongy structure.
- If these Fibres then transmit nou-
rishment to plants, may we not infer ⁺
the nerves convey nourishment
in a like manner. even supposing
the vessels of plants are tubular



Nutrition

265

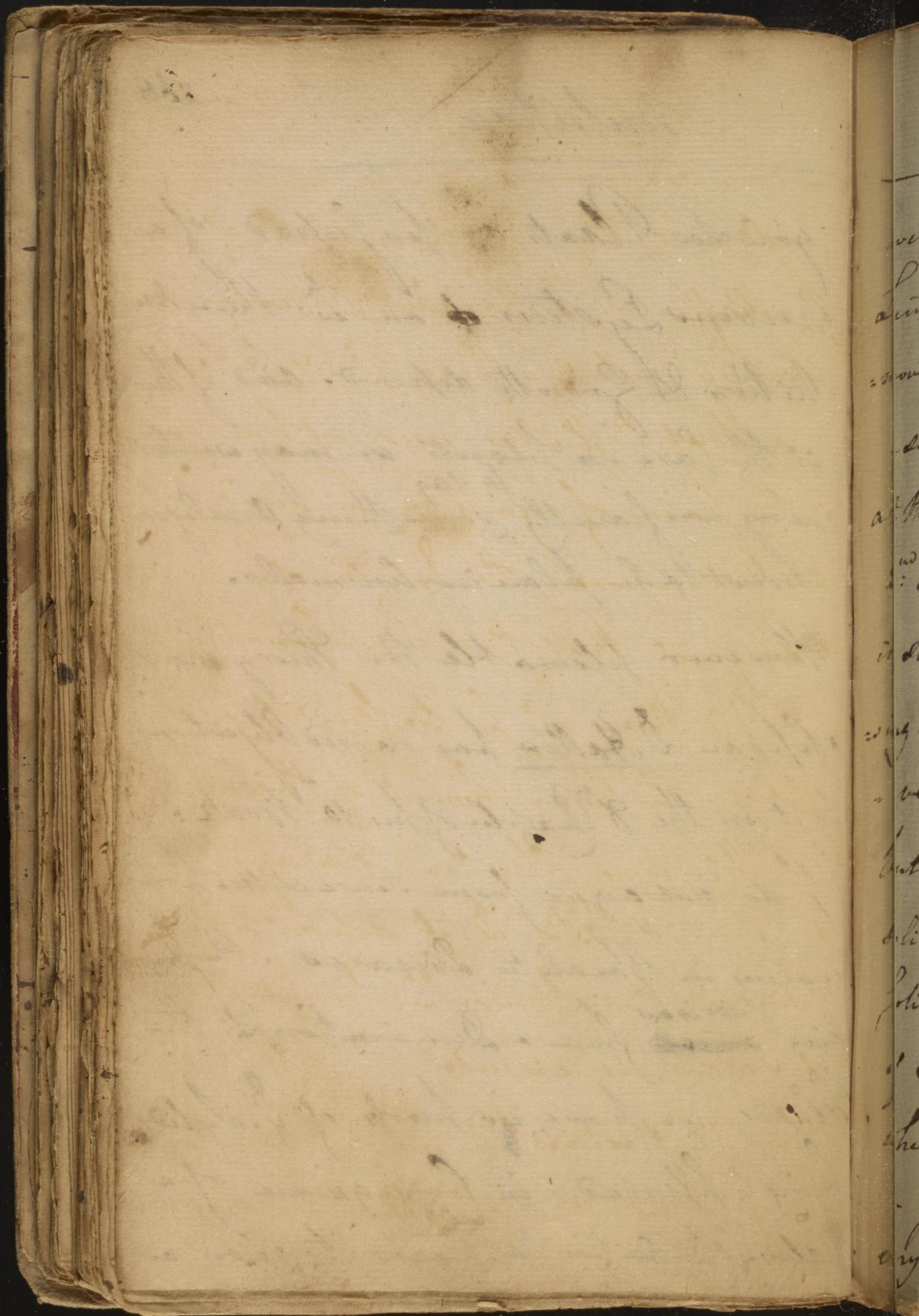
yet we know of no power capable
of moving Fluids in them. Capill^r:
Attraction acts as well in a Spongy
Fibre as in a hollow Tube. The Fibres
of Plants have a subtle Fluid in y^m:
w^{ch}: we know from their being possessed
of Irritability in consequence of y^e action
of external Bodies on them. I choose
to call it Irritability to distinguish
it from Sensibility w^{ch}: more properly
belongs to animals. The trinity we see
promotes the growth of plants almost
to the Eye. Light w^{ch}: shows us y^e presence
of some fine Ether in them. so that

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you see Plants are supposed of a
Nervous System & on w^h their Nu-
-trition & Growth depend. And if this
is the case in plants we may venture
very confidently ^{to say} something analogous
must take place in Animals.

However plausible this Theory may
appear Dr Haller has raised Objections
to it in the 8th Chapter of his 10th Book.
"I do not argue from Sense & Motion
ceasing in Paralytic Diseases. The shrin-
-king ^{arises} ~~arises~~ from a Diminution of the
Fluids. we have no proofs of $\frac{2}{3}$ Solids
being lost in consequence of a
Palsy. Nutrition appears to go on as



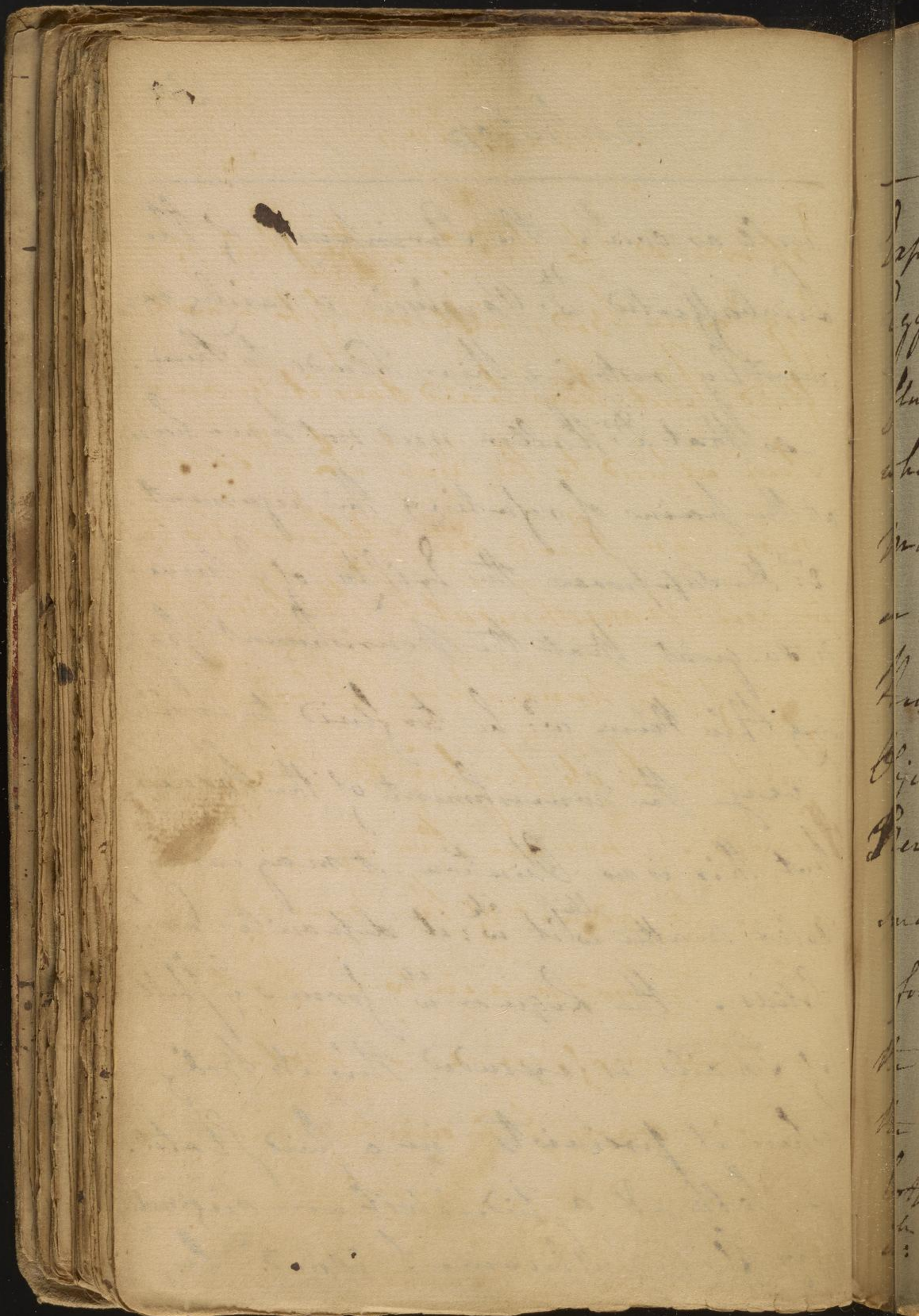
well as even. the Shrinking of the
Limb affected wth Paralysis is easily re-
moved by restoring their Fluids to them.

- so that Dr. Haller need not have been
at the pains of refuting this Argument.

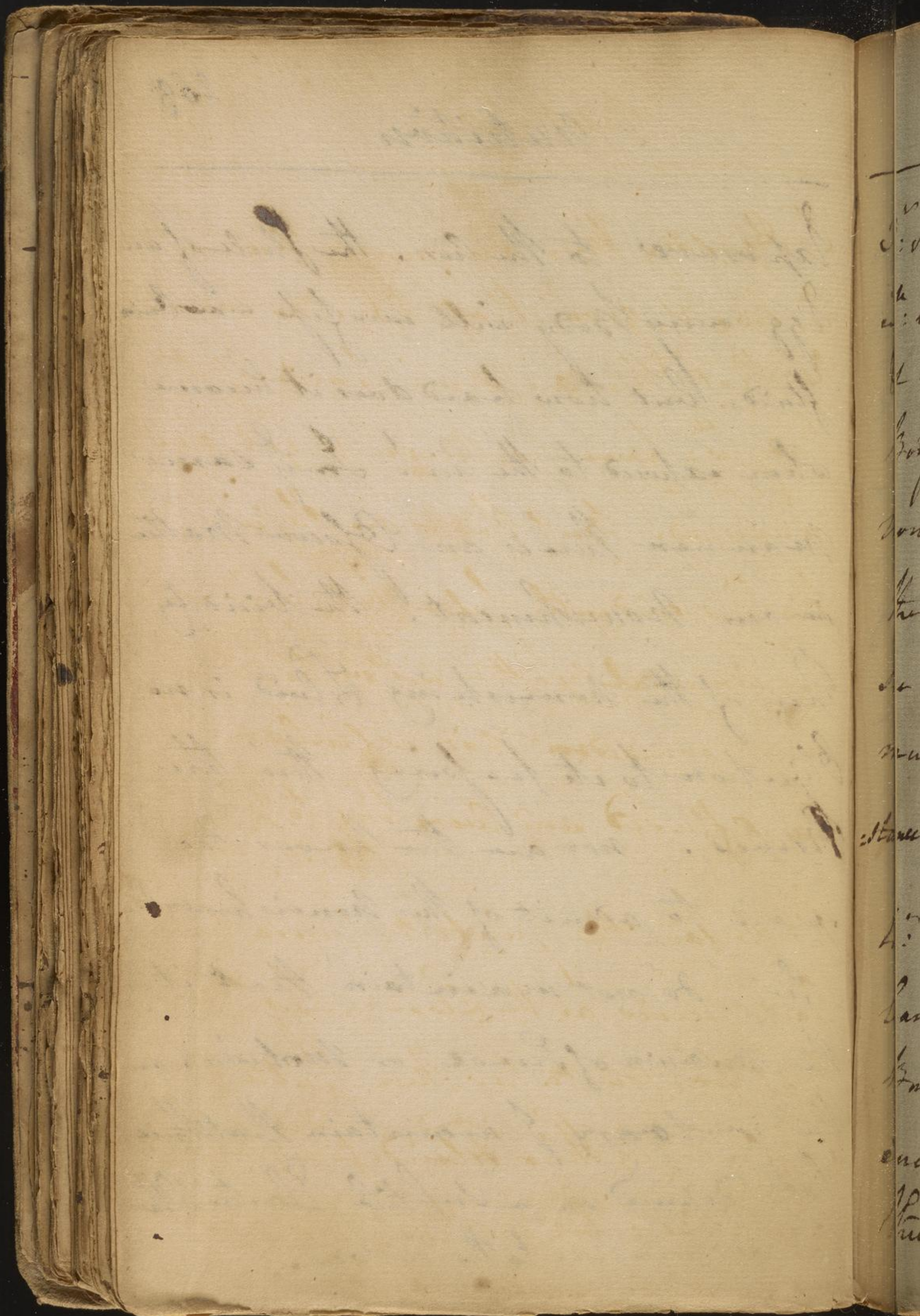
2nd He supposes the Exility of y^e Nerves
is so great that the nourishment pass-
ing thro' them wth be too fluid to con-
vey the nourishment of the Bones.

but this is no Objection. it may carry
solid matter wth it wth it deposits any
Solids. the Liquor wth forms y^e shell
of Snails is exuded thro' its body
when it persists in a fluid state.

- Silk & a spider web were originally
very fluid, but become hardened. by



Exposure to the air. the shell of an egg every body will can see was ~~was~~ fluid, but how hard does it become when exposed to the air! In the same manner there is an Opaque matter in our nourishment! the brillidity then of the nourishing fluid is no objection to its passing thro' the Nerves. nor are the nerves too small to admit of this nourishment. for I do not maintain that it is the medium of Sense or Motion, on the contrary I maintain that these both depend on a subtle Elastic Matter which is peculiar to the nerves.



3rd He says there are many animals
which live & grow that have no nerves
& that there are some parts of the
body which have no nerves & yet are
nourished. But this is no objection
the 1st is evidently false, & whenever we
see animal matter without nerves we
must consider it is cellular sub-
stance effused and creeping to fibres.

4th He says the greatest Viscera having
least nerves as the Liver Lungs &c.
But he mistakes their Bulk by
including their Fluids to which they owe
their Life. For my part I think their

[Faint, illegible handwriting on aged paper, likely bleed-through from the reverse side. The text is written in a cursive script and covers most of the page.]

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solid matter is exactly proportioned to
thin nerves, in ^{the} same manner as the parts
of the Body

5: He says there are cases of Atrophy
without a Loss of Sensation. This may
easily be accounted for from w: we said
before. The other of the nerves may
continue to transmit Sensations
after the passage of the nourishment
this then is Obstructed.

This finishes our list of Objections.
I do not think them of
any force, nor am I induced by
them to desert my Opinion, but on
the contrary am more confirmed in
them.

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3rd In what manner is this nourishment thus separated & transmitted to the Solids applied to them? This is a most difficult Question. it is not indeed that we have found that nourishment is applied to our Solids, we must now enquire how it is applied to them. Here we must again call in ^{the} analogy of Plants! it is a well known Fact that if any common vegetable is brought into a warm Room in the dead of winter vegetation immediately appears in it. This has been attributed by botanical Physiologists to Heat &

[Faint, illegible handwriting in cursive script, likely a letter or journal entry. The text is written in dark ink on aged, yellowed paper. The handwriting is very light and difficult to decipher.]

Promoting the Circulation of the Sap
from the Root up thro' its Branches.

- But if the same plant is placed behind
a hot House in such a manner as y:
one of its Branches can ^{insinuate} ~~insinuate~~ it:

self into a window in the hot House all

the Marks of Vegetation appear in

this Branch while the rest of y^e plant
remains dry. How shall this be

accounted for? here the Heat could

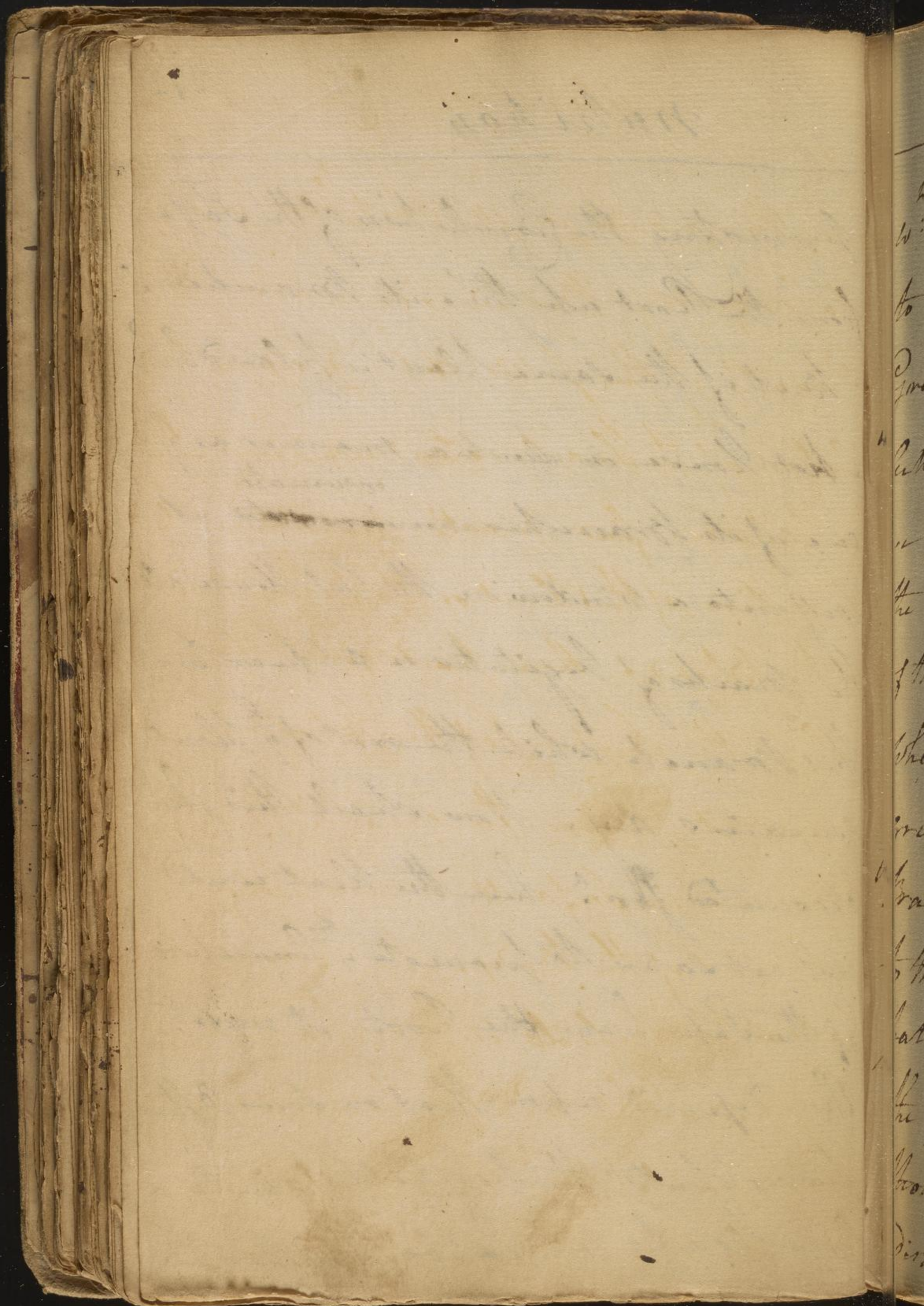
not act so as to promote y^e Circulation

of the Sap from the Root, it must

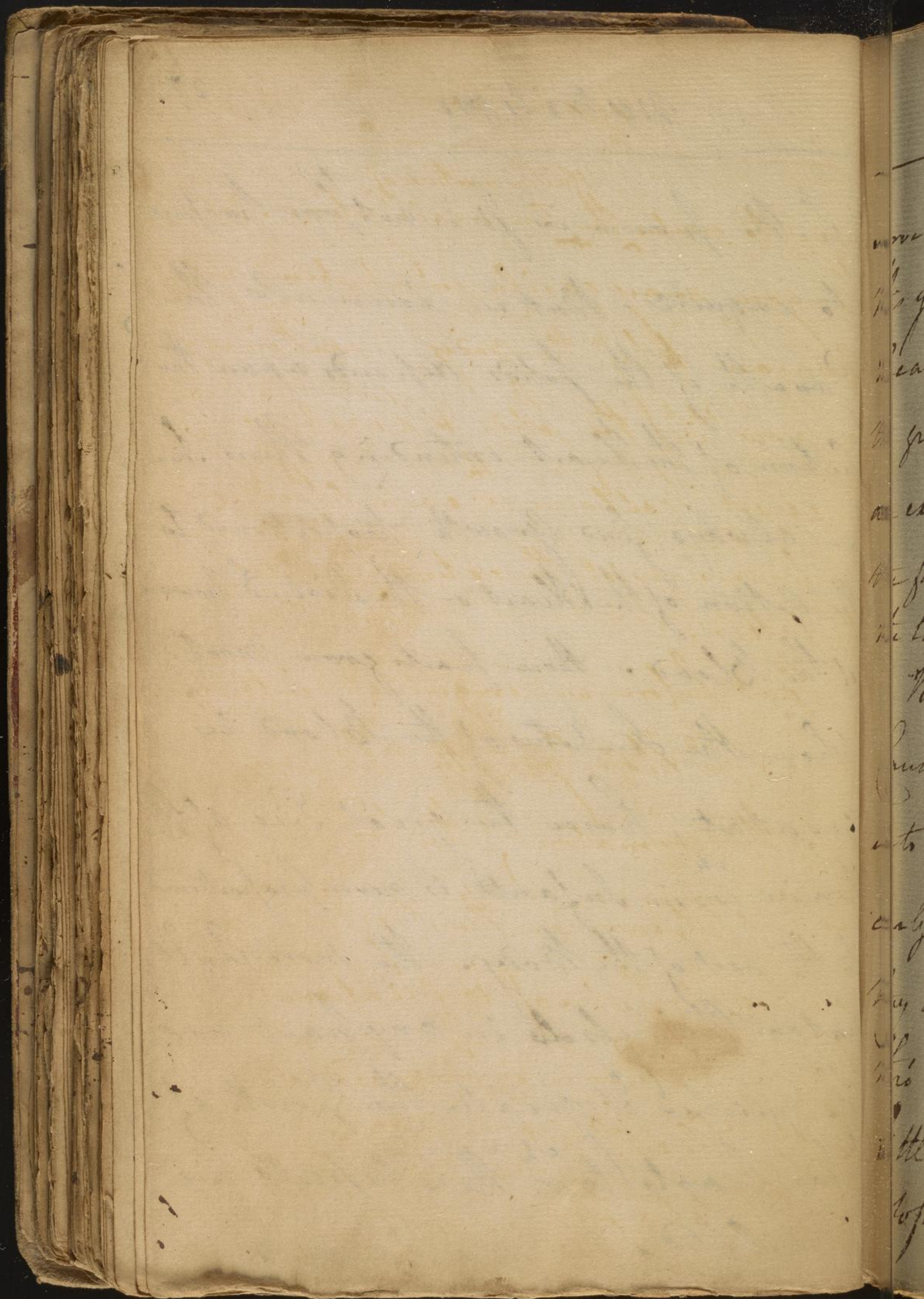
then depend upon Heat or some other

power y^t puts the Vegetable into a

Condition fit to receive an Auction

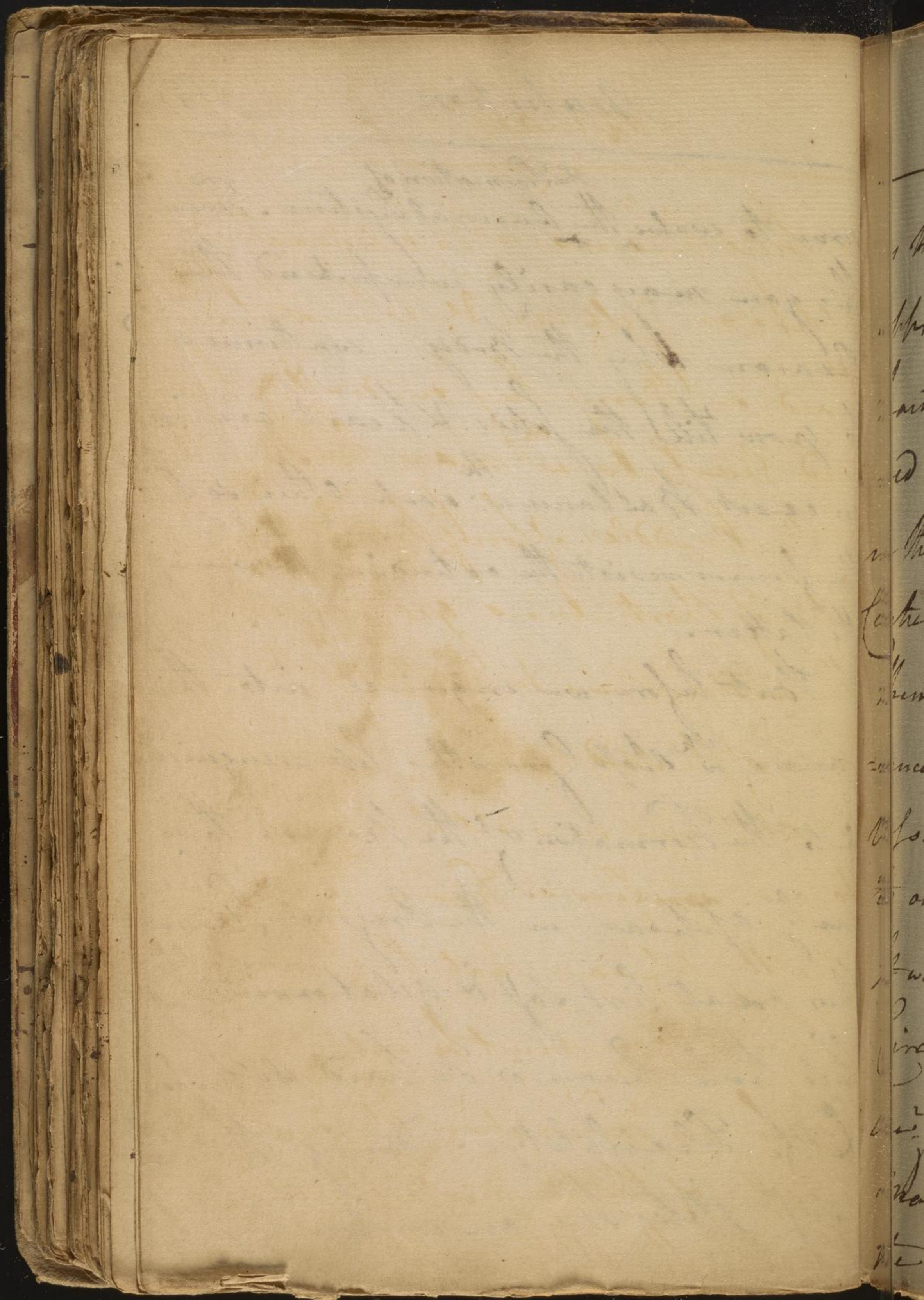


is: This power is ^{to} it is not our purpose
to inquire. But in Animals the
Growth of the solids depends upon the
Action of the Heart extending them. Hence
we always find Growth proportioned to
the Action of the Heart or the Distend: power
of the Blood. Those parts grow most
where the Impetus of the Blood is
greatest, hence the great Size of the
Brain ^{is} in Infants is never proportioned
to the rest of the Body. The more lax &
patent the vessels in any part are
the quicker & greater the Growth of
those parts ^{is} to w. These vessels are
distributed. This in a few words may

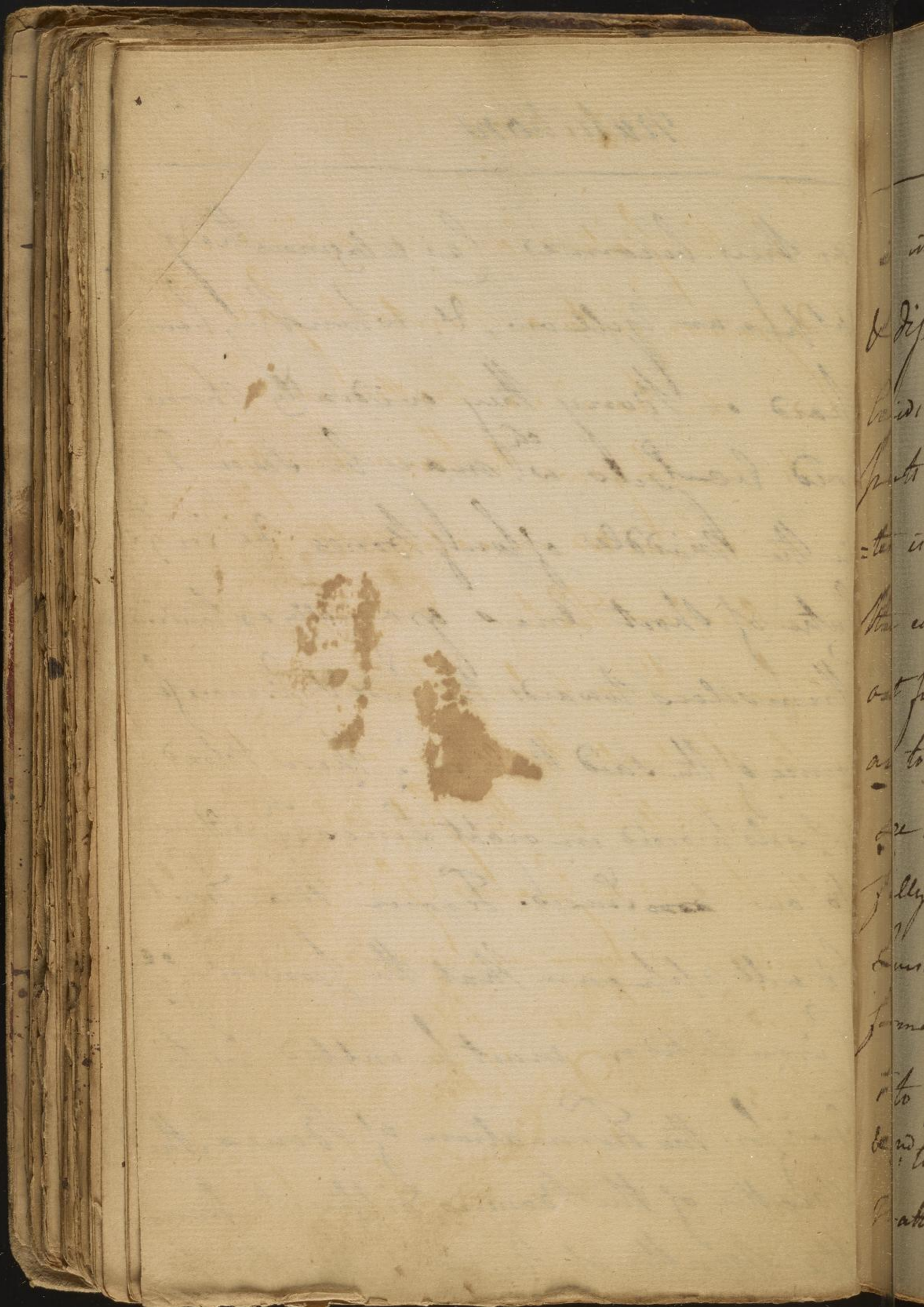


serve to evolve ^{the Formation of} the Animal System. From this you may easily comprehend the Reason why the Body continues to grow till the Solid & Heart are in an exact Balance w: each Other so that the former resist the extending power of the latter.

But before we enquire into those Causes w^h stop Growth let us enquire into the Formation of the Bones. These early appear in the Original Stamina they are at first soft & gelatinous, but this time become so hard as to show little Flexibility. During their soft state they are colourless but

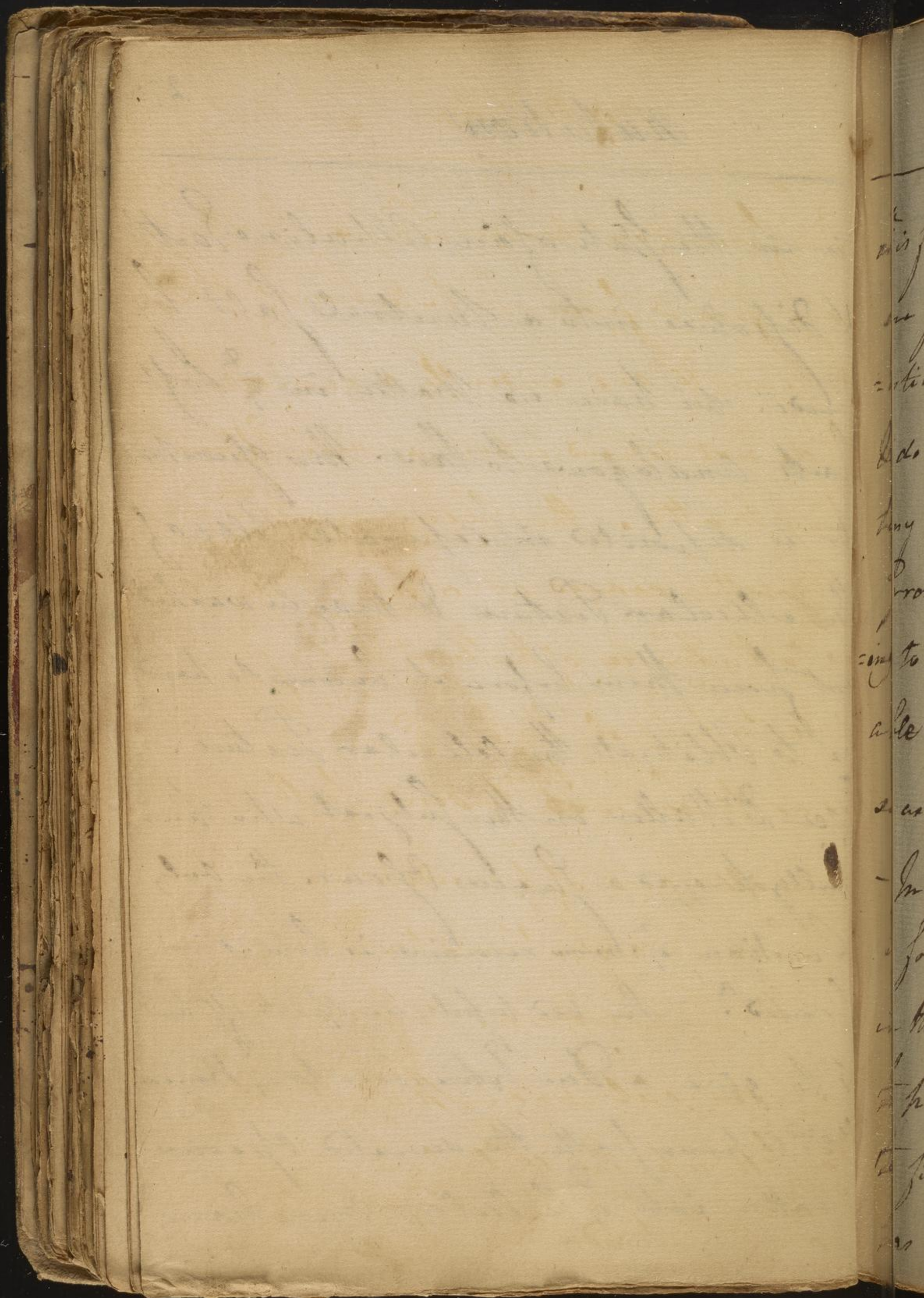


as they become Cartilaginous they appear yellow, & when they become hard or Bony they evidently show red vessels ^{ch} w^h may be seen 1: in the middle of long bones & in 2: Centre of short ones gradually extending themselves towards the Ends & Circumference of the said bones: These blood-vessels proceed in right Lines ^{ch} w^h is obvious to our ~~sense~~ Senses. From these Facts it will appear that the power of Circulation must be called in to aid: for the Formation of Bones. the Matter of the Bones is different from the Matter of the soft parts. It



Nutrition

is in the state of an Alkaline Earth
 & dissolves into a neutral salt by
 acids. we have no matter in $\frac{1}{2}$ soft
 parts analogous to this. this opacous mat-
 ter is deposited in separate cells of
 the cellular texture & may be washed
 out from them before it becomes so hard
 as to obliterate the cellular texture.
 see Dr Haller on this subject who has
 fully proved a Pusculus Opacus. the only
 Question $\frac{1}{2}$ now remains is how it is
 formed? - the red vessels we speak of tend
 1st to give a due extension to $\frac{1}{2}$ Bones
 & 2nd to pour forth the secreted opacous
 matter into $\frac{1}{2}$ cellular membrane



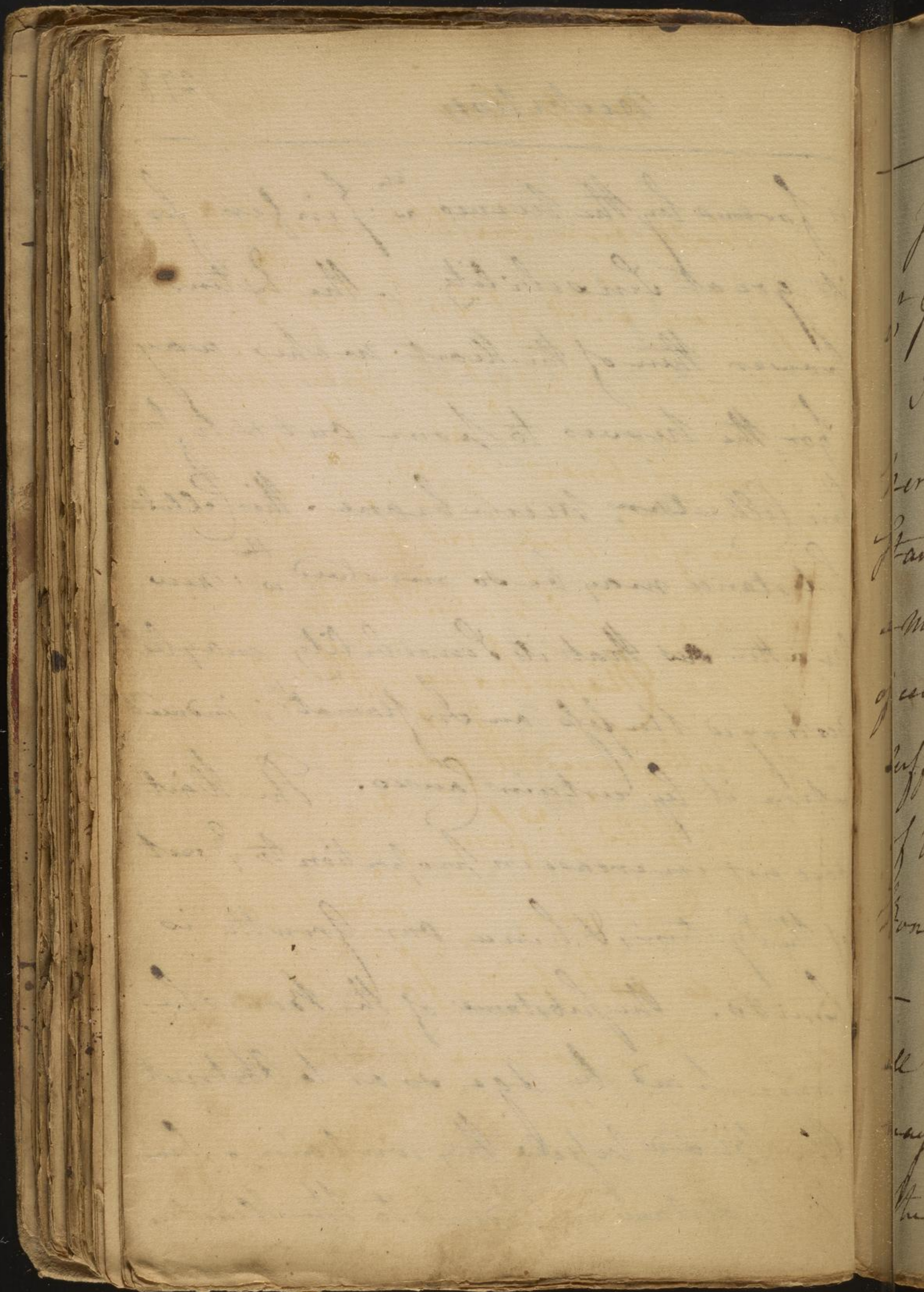
^{the} is formed on nervous Fibres. Calluses
are formed from an Extension of the Peri-
ostium & are evidently organized parts,
& do not depend upon a mere Effusion of
lony matter. The Reason then why
Growth ceases at a certain age is owing
to the Force of the Heart no longer being
able to propel the blood in the Bones
so as to cause ^{them} to send forth Fibres.

- In all Cases of wounds where new flesh
is formed a Inflammation must be excited
in the nerves so as to cause them
to pour out more Nutritious matter
to fill up the cellular Texture ^{the} w:
has been produced. This cellular sub:
stance

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is formed by the nerves ⁱⁿ infer from
its great Sensibility. The Extensile
power then of the heart makes way
for the nerves to pour out & to form
this Cellular membrane. This Cellular
Substance may be so involved ^{the} in new
Matter ~~as~~ that its Sensibility may be
destroyed unless an Inflammatⁿ is induced
upon it by certain Causes. The heart
does not increase in proportion to $\frac{1}{4}$ part
of the System, & hence our Growth is
limited. The substance of the Bones be-
come hard by Age so as to obstruct
the blood vessels they contain, hence
a Resistance is produced to the heart.

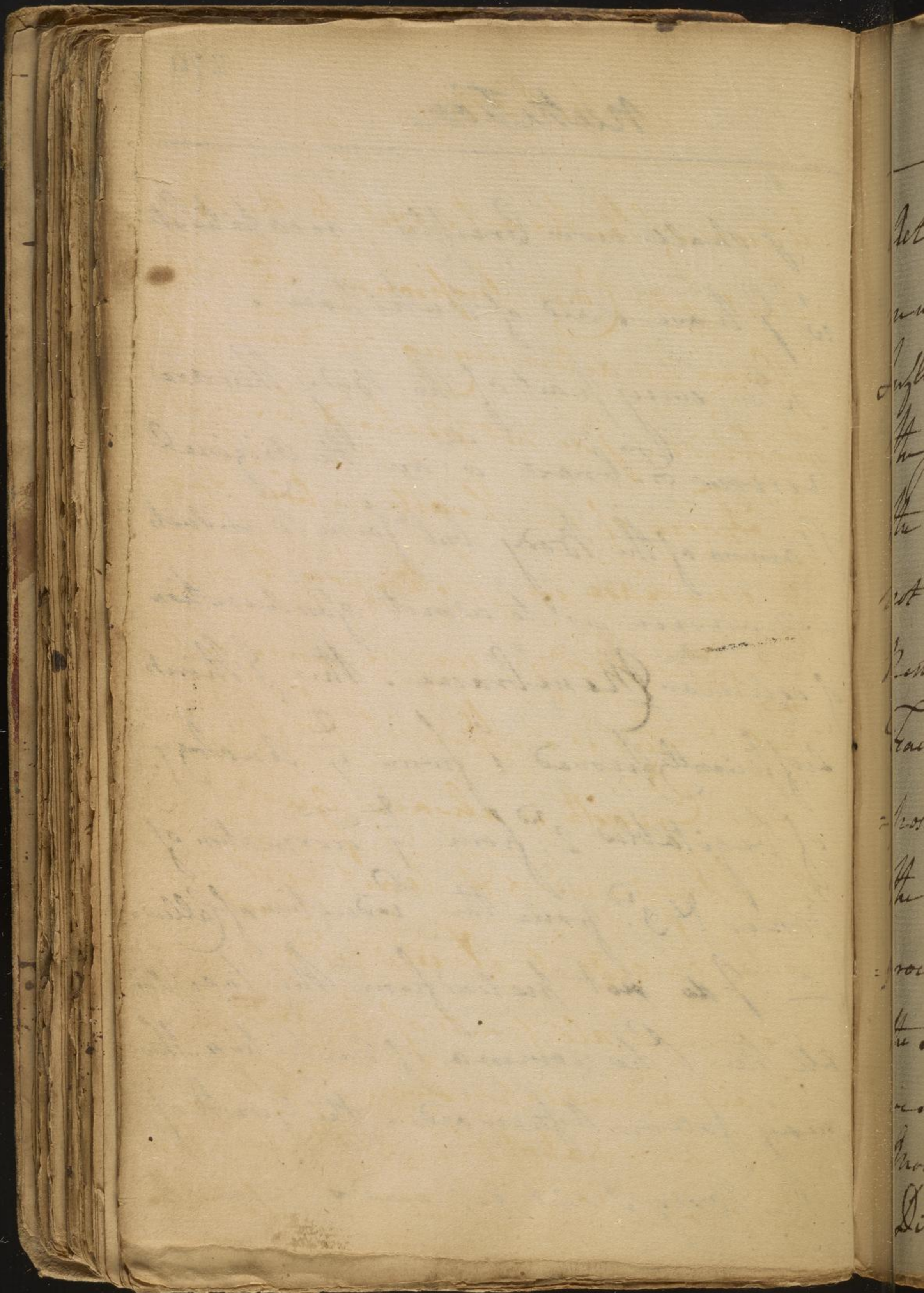


Nutrition

I shall now briefly recapitulate
w^h I have said of Nutrition.

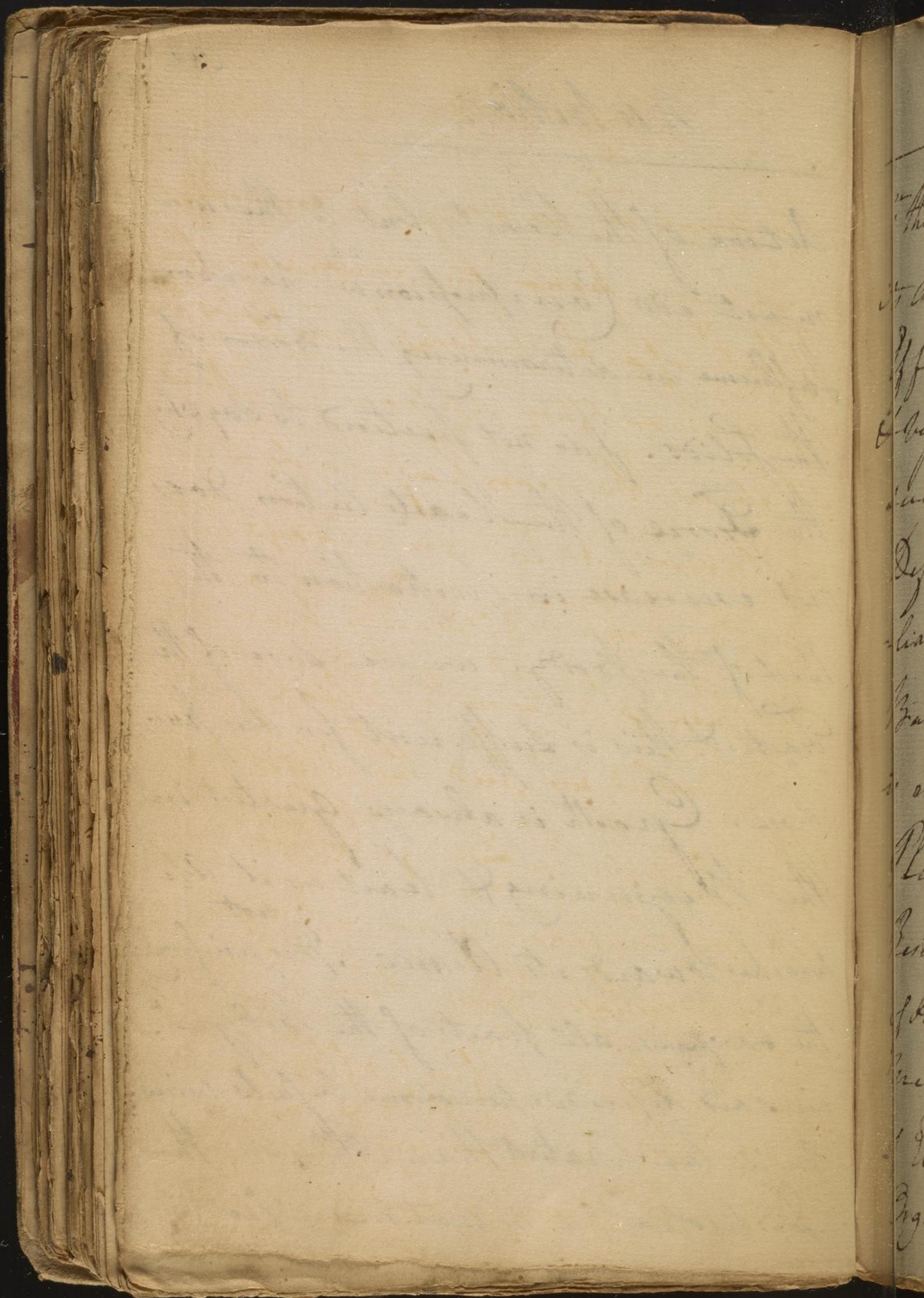
In every part of the Body there are
Nervous Fibres ^{as} in the Original
Stamina of the Body but formed in such
a manner as to admit of an accretion
of cellular Membrane. This I think
sufficiently proved 1^o from $\frac{2}{7}$ Analogy
of vegetables 2^o from $\frac{2}{7}$ Formation of
Bones & 3^o from the Production of Callus.

— I do not pretend from this to explain
all the Phenomena of Nutrition. These
may follow afterwards. The Growth of
the Body I said depends upon the



Nutrition

Action of the Heart, but to this we must add ^{the} Consumption w. has some Influence in determining the Form of the Solids. I do not pretend to say why the Force of the Heart's Action does not increase in proportion to the Rest of the Body. we are sure of the Fact, & this is sufficient for our purpose. Growth is always greatest in the Beginning & least as it ^{not} approaches towards its Acme. It is uniformly the same in all parts of the Body w. we said depends upon some vessels being more lax & patent than others. This Disproportion is most manifest in



Nutrition

^{ch}
 The head w: we see first arrives at
 its name. Hence the Reason why the
 Effects of a Disproportion between the Fluids
 & Solids so often appear in ^{the} Head
 such as Hemorrhages - Serous
 Effusions &c. ^{ch} are always pecu-
 -liar to young children. When the
 Balance of between the Fluids & Solids
 is established we find the Effects of
 Plethora in the Lungs where the
 Resistance is least hence ^{the} Frequency
 of Hemorrhages from them in young
 men. The last Effect of the powers
 of Evolution is to form ^{+ 333 + 2} Genital
 Organs ^{ch} w: gives a due Balance

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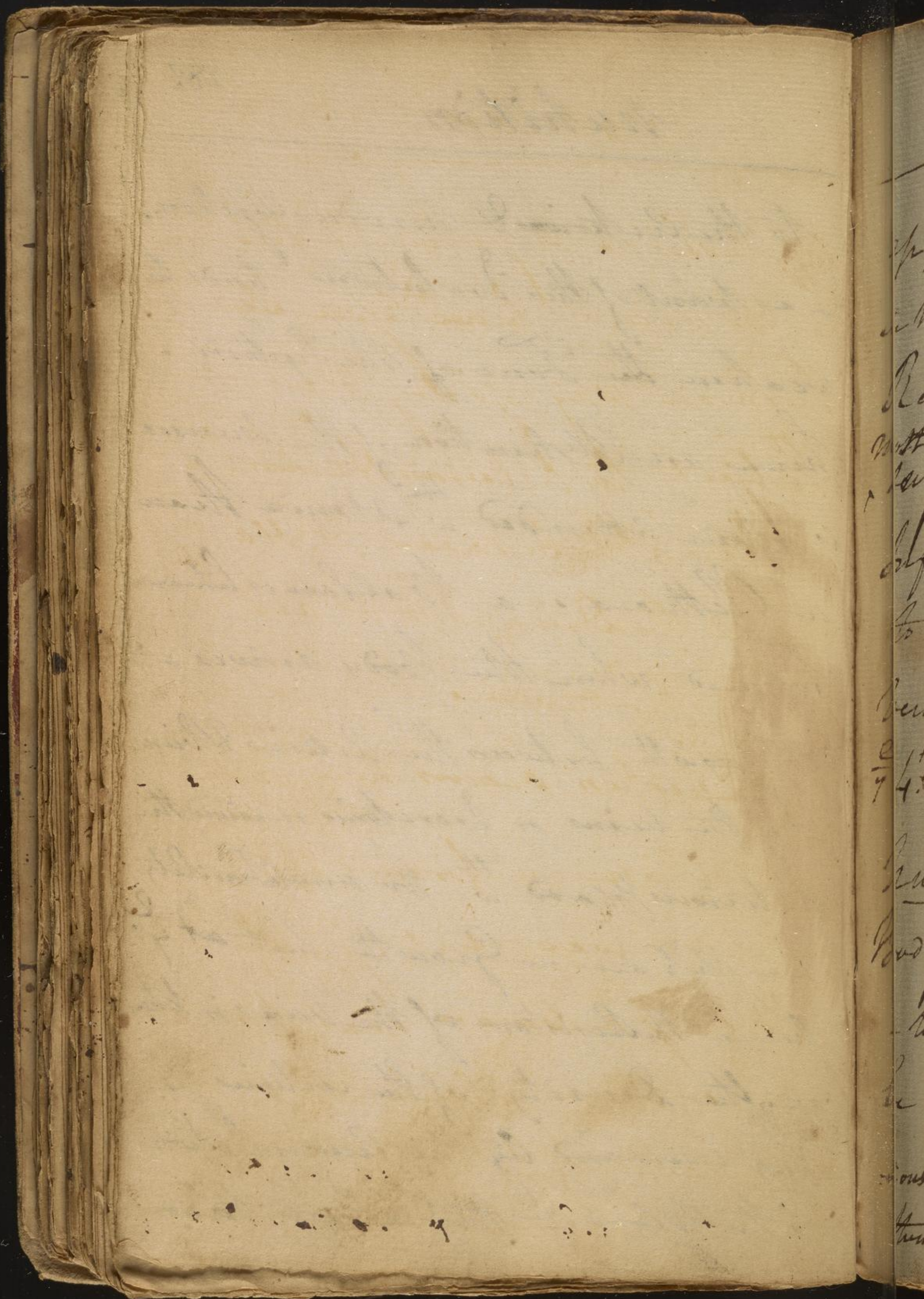
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Nutrition

To the Arteries & Nervous System.
 — a want of this Evolution tends to
 weaken the Tone of the System.

• Hence an Obstruction of the Venues
 is often attended wth Atonia than
 a Plethora. a Gallane is likewise
 formed when the Body arrives at
 its growth between the Arteries & Veins.

— if the veins or Secretories receive the
 Arterious Blood wth too much Facility
 we sh^d see no Growth, but at y^e
 same time the Resistance of the veins is taken
 off. the Density of the Arteries be-
 ing increased by the accumulation
 of the Blood, & the Plethora then

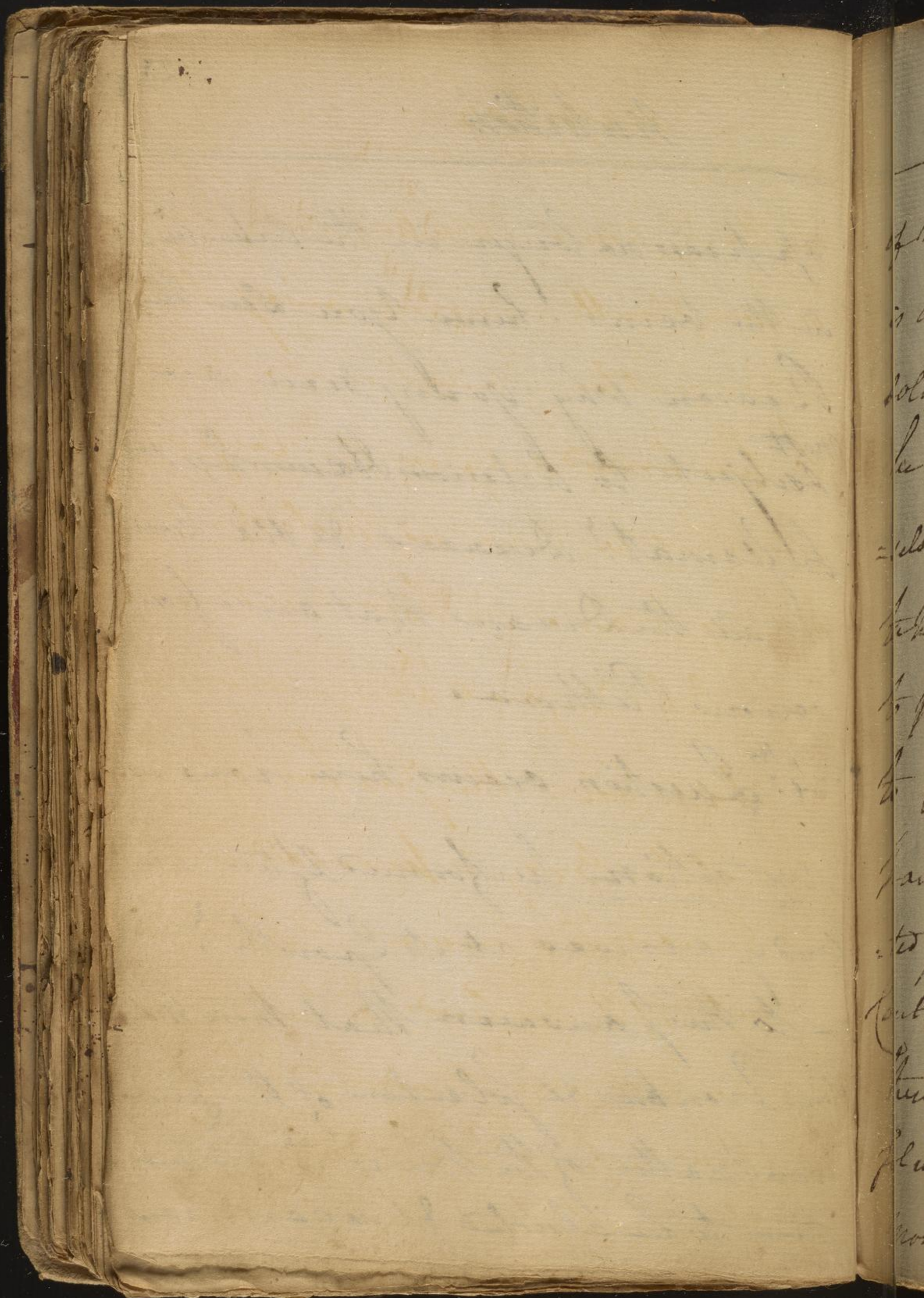


Nutrition

appears no longer in the Arteries but
in the veins. Hence you see the
Reason why young men are
^{most} subject to Arterious Hemorrhages and
Inflamat: Diseases & old men
to all the Diseases that arise from
venous Plethora.

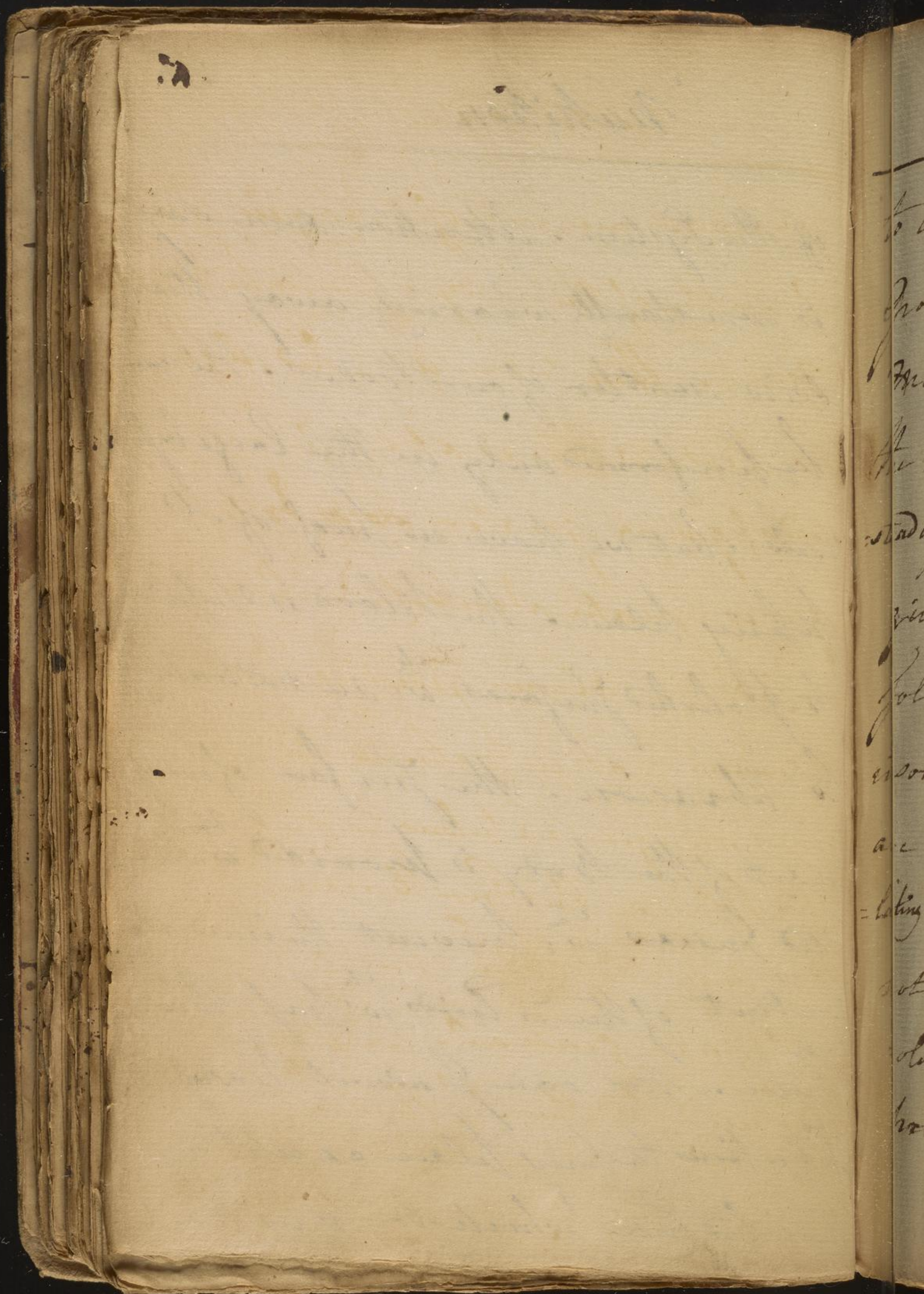
$\frac{2}{7}$ 4th Question occurs here how is
Nutrition performed after the
Body arrives at its Growth?

- to this I answer that there may
be Excess & solution of the Calca-
rious Matter of the Bones ^{ch} which disposes
them to be absorbed & so carried out



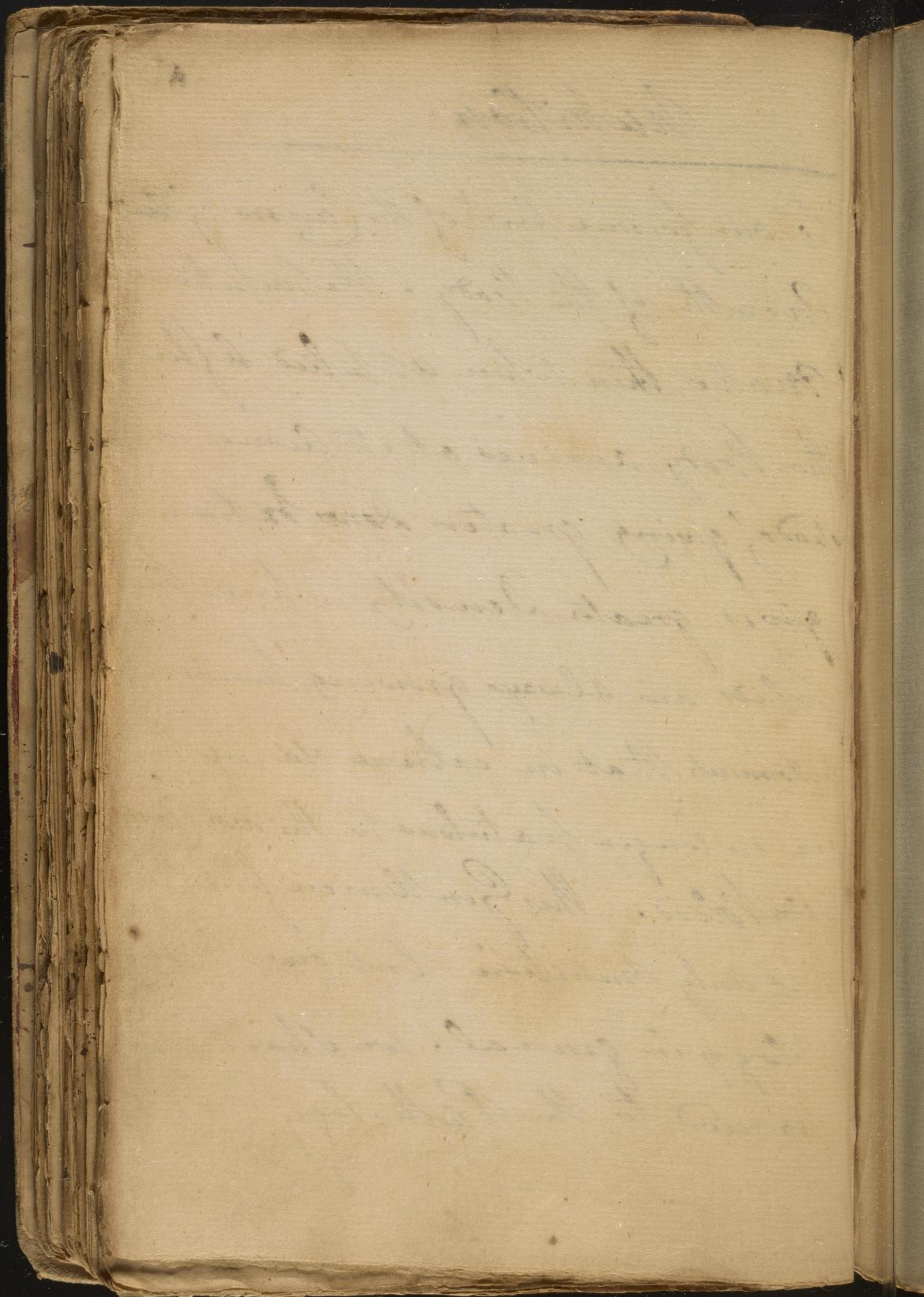
Nutrition

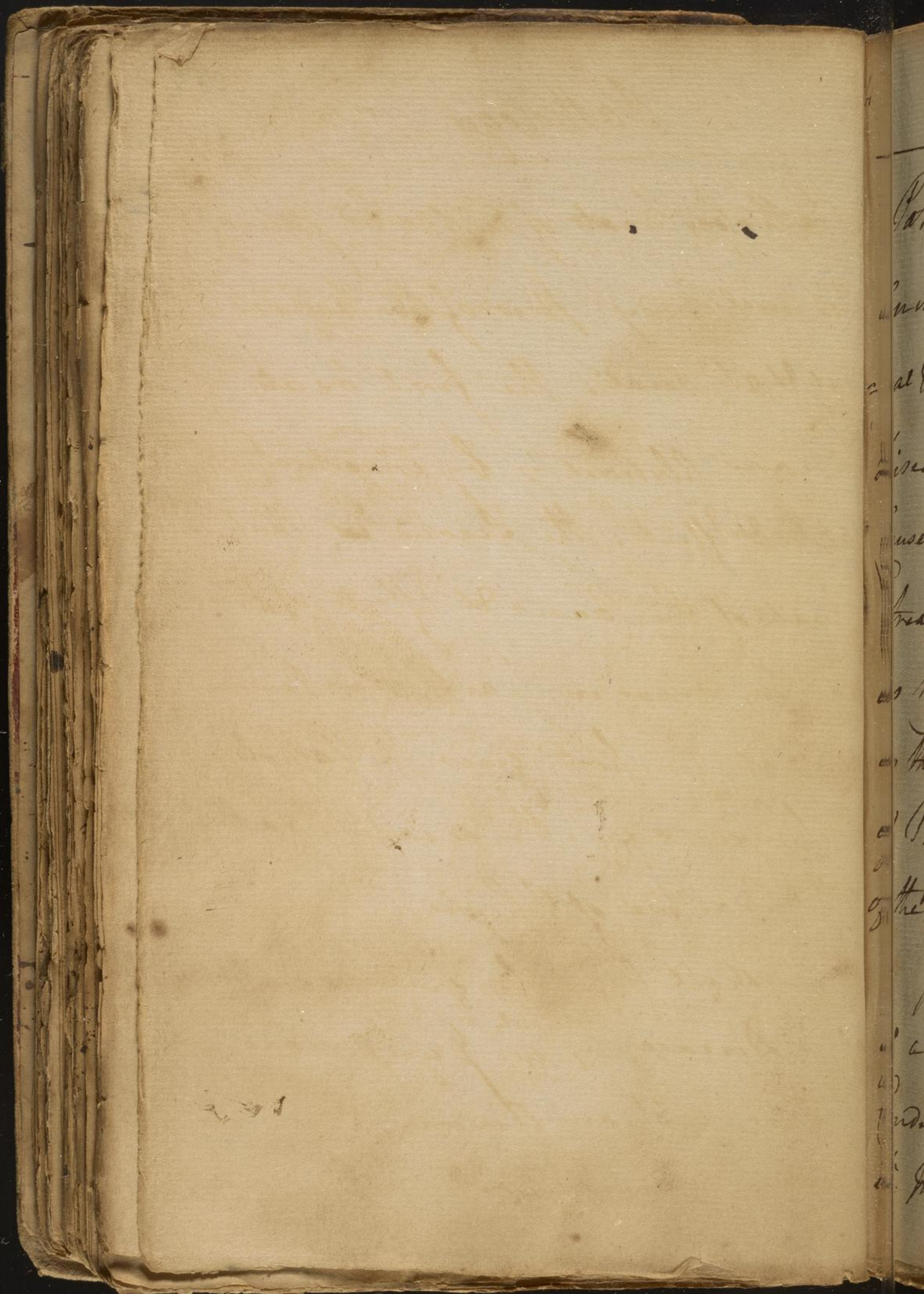
of the System. Attrition some say
 is constantly wearing away the
 solid matter of our Bodies. This can
 be performed only in the largest
 vessels, but we have no proof of its
 taking place. The blood is applied
 to polished surfaces ^{ch} w: are not liable
 to abrasion. The surface of every
 part of the body is provided th w: secret-
 ed juices ^{ch} w: prevent the immediate
 contact of the fluids ^{ch} w: pass thro:
 them. Nor can I admit rashes or
 solutions taking place except in
 morbid cases which bring us back



Nutrition

to our former list of the Causes of the
Growth of the Body. The nutritious
Matter then when applied after
the Body arrives at its Acme in-
stead of giving greater ~~and~~ Extension
gives greater Density, hence the
Solids are always growing harder
inasmuch that in extreme old Age they
are no longer patentous to the ~~old~~ Circu-
lating Blood. This Gentlemen finishes
not only Nutrition but our Physi-
ology in general. we shall next
proceed to the Pathology.





Pathology treats of the morbid state of the Animal Body. It is of two kinds: General & Special. The first treats of Diseases Abstractly by investigating their Causes & Effects. The second is that ^{ch} w: treats of the Causes & Effects of Diseases as they occur in particular Persons. so that the first gives the Pathology of Physiology, the second ² Pathology of the Practice of Physic.

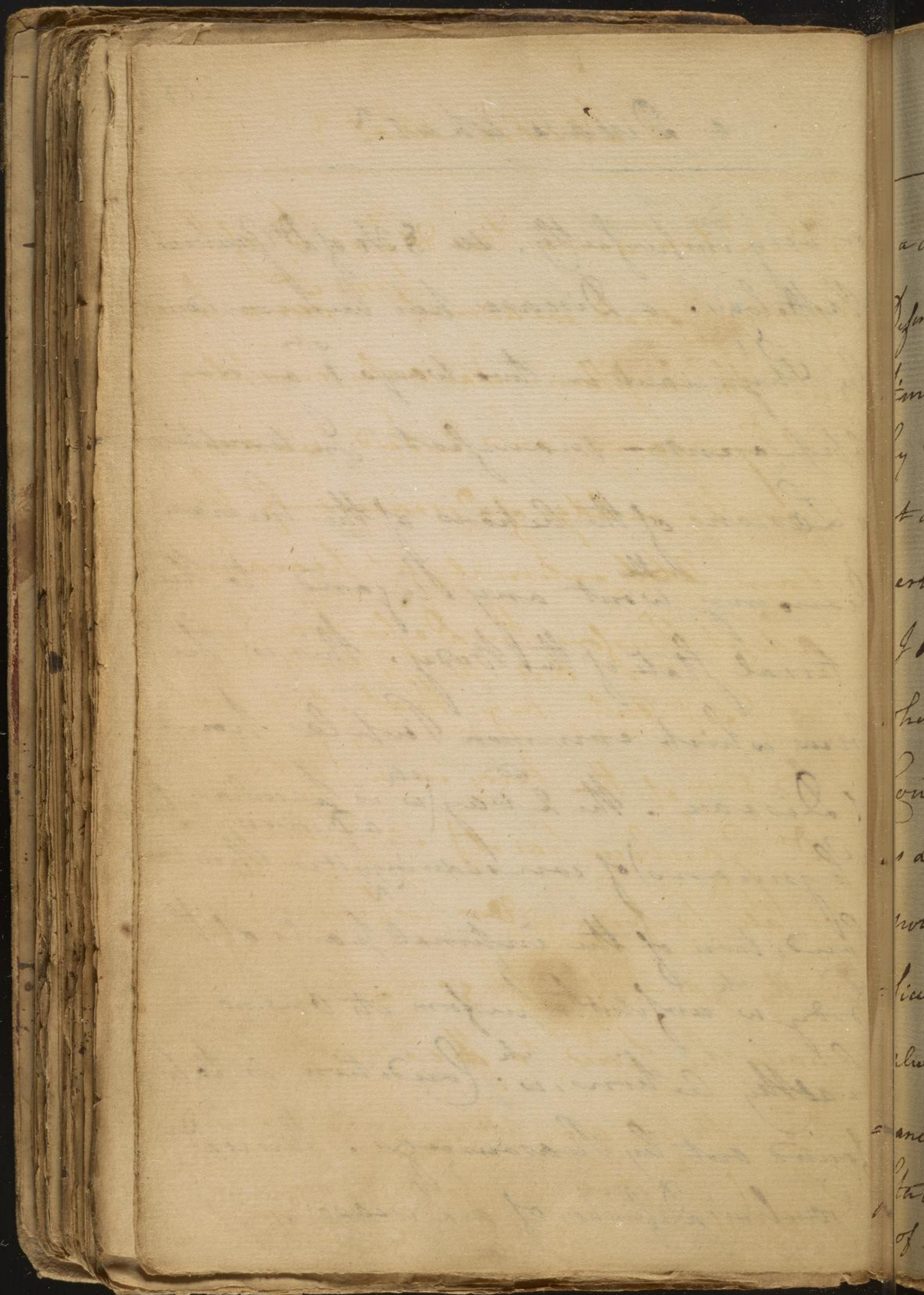
I shall begin by giving a Definition of a Disease by ^{ch} w: I understand that Condition of an Animal Body in ^{ch} w: its Functions are not performed at all

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a Disease what?

or very imperfectly. see § 34 of Dr Gaubius's Pathology. a Disease has been considered by Physicians in two ways 1st as an Apparent - manifest Interruption or Lesion of the Actions of the human Economy wthout any Regard to the internal state of that Body. This is the view which common People have of Disease. The 2nd way (w^{ch} is peculiar to Physicians) of considering it is that Condition of the internal parts of the Body w^{ch} is unfit to perform its ordinary healthy Actions. w^{ch} Condition is to be found out by Reasonings. This is Dr Gaubius's Definition of a Disease.

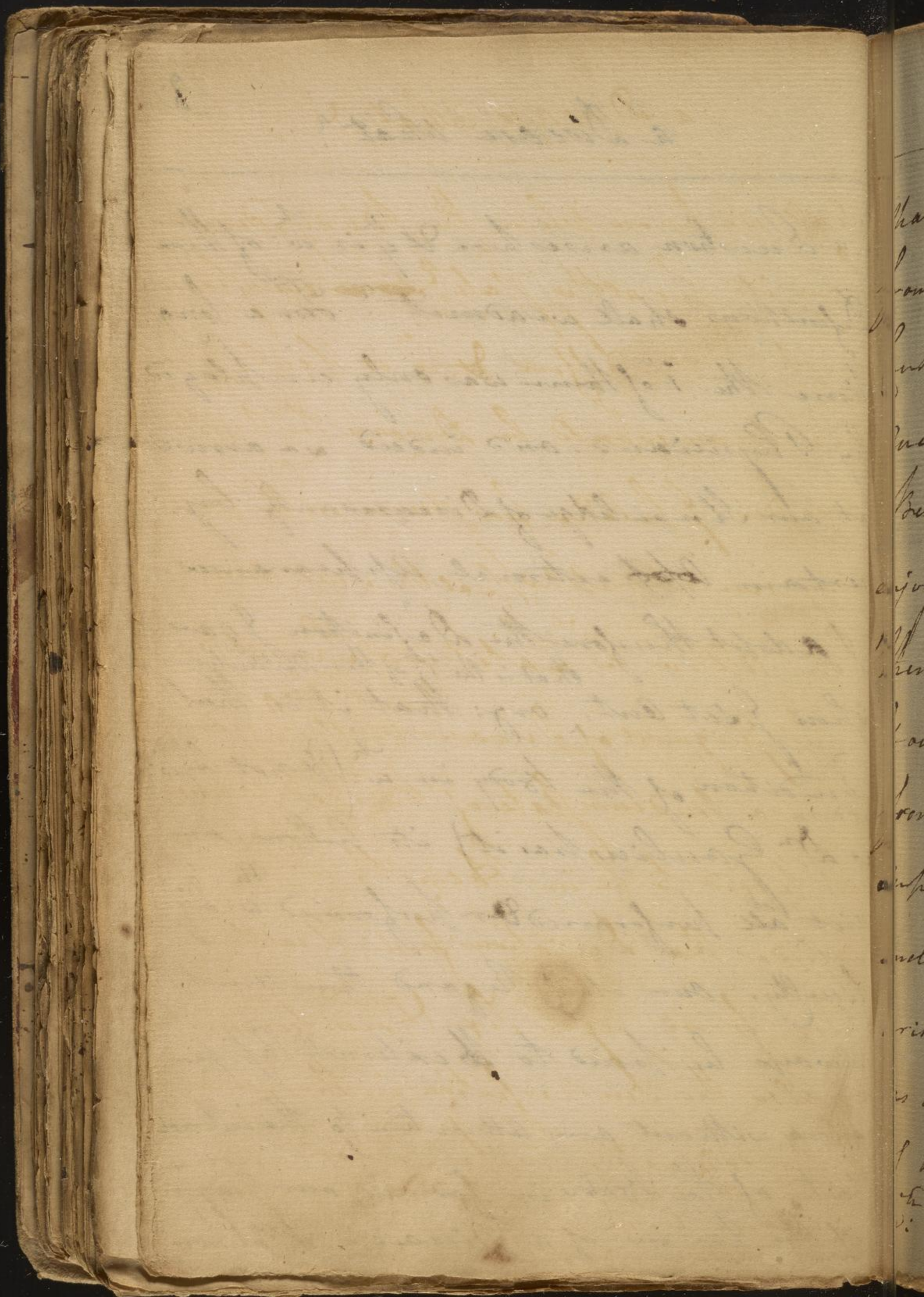


a Disease what?

289

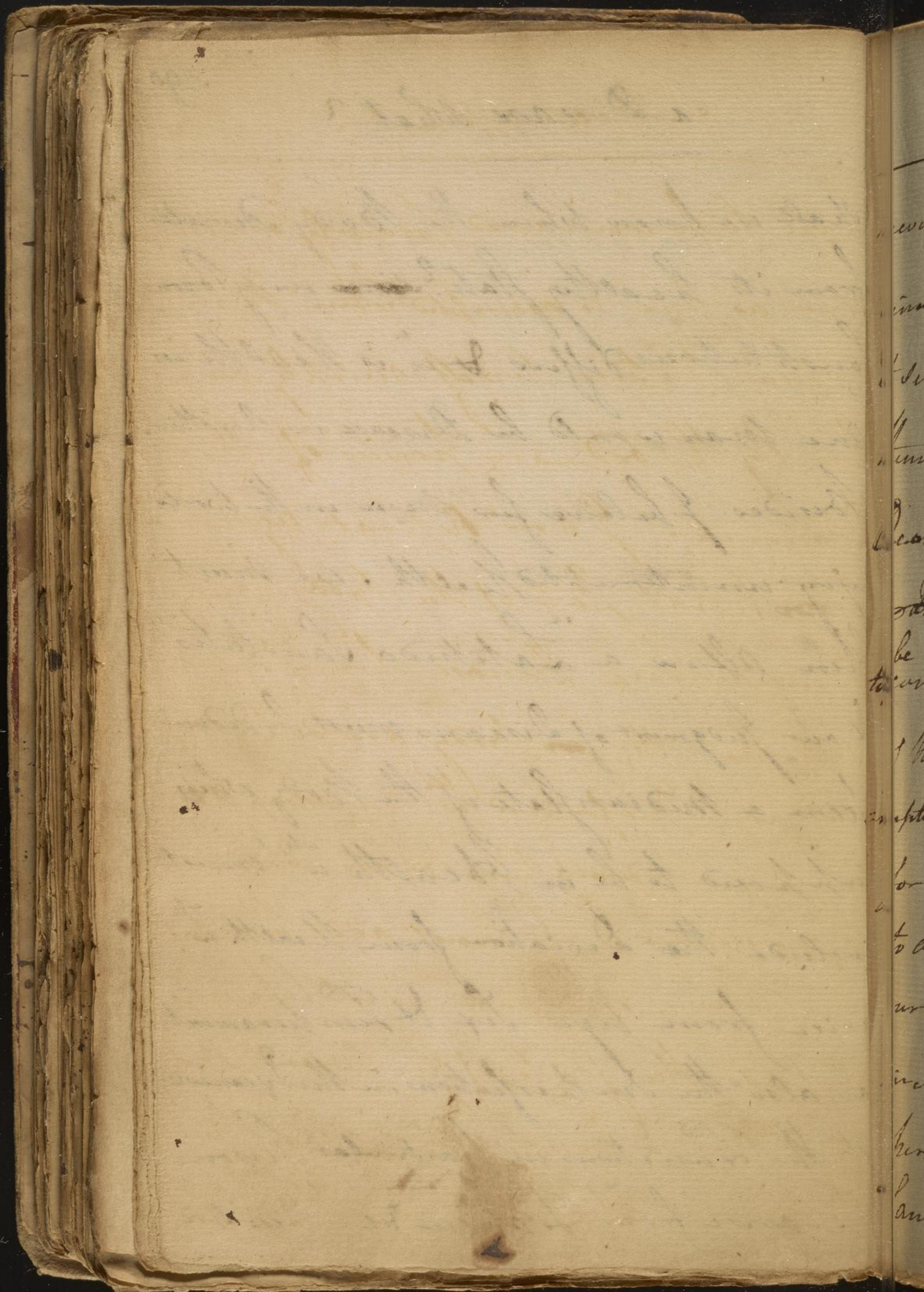
a Question arises here & y^e is w^{ch} of these Definitions shall we admit? For a long time the ist of them was only employed by Physicians, and indeed we arrive at our Knowledge of Diseases only by certain ~~of~~ external Appearances.

I adopt therefore the Definition I gave when I set out, ^{that is the ist of these Distinctions} viz: that it is that Condition of the Body in w^{ch} (I do not by w^{ch} as Dr. Gaubius has it) its Actions are not ^{all} performed or performed wth Difficulty. Our chief Regard then must always be paid to ~~the~~ external Appearances without any Attention to the internal State of the Body in forming our Judgm^t of the Presence of a Disease. But how

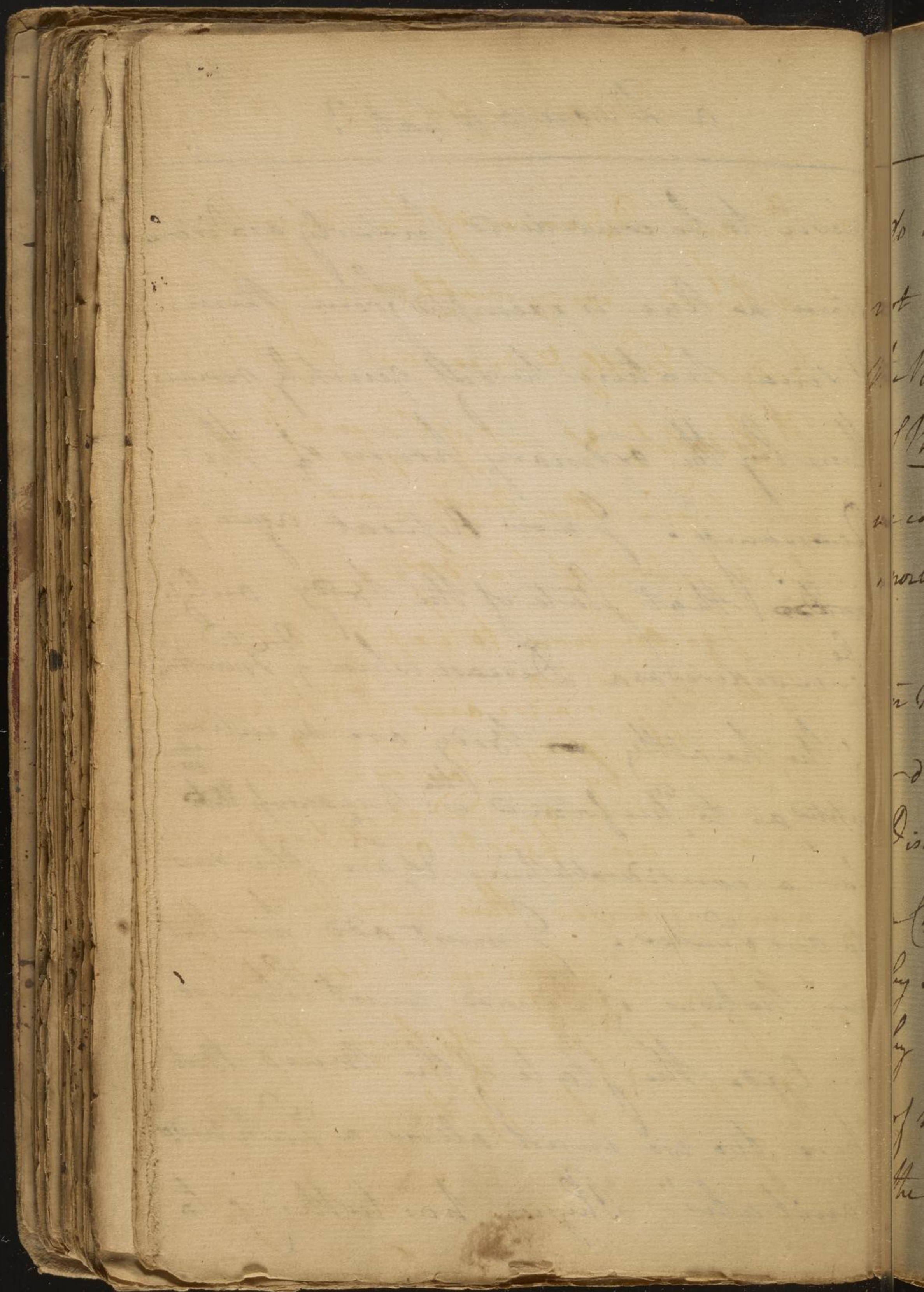


shall we know when the Body deviates
from its healthy state? ~~since~~ every Persons
Constitutions differs & is Health in
one man would be Disease in another.

Besides I believe few men in the world
enjoy uninterrupted Health. we must
then allow a "Latitudo Sanitatis"
& our judgment of Diseases must be deduced
from a medium state of the Body when
supposed to be in Health ^{ch} we must
include the Deviations from Health ^{ch} we:
arise from Age Sex & Temperament,
as also the Imperfections in the Exercise
of the Functions in particular Persons
^{ch} we arise from Fatigue &c. therefore

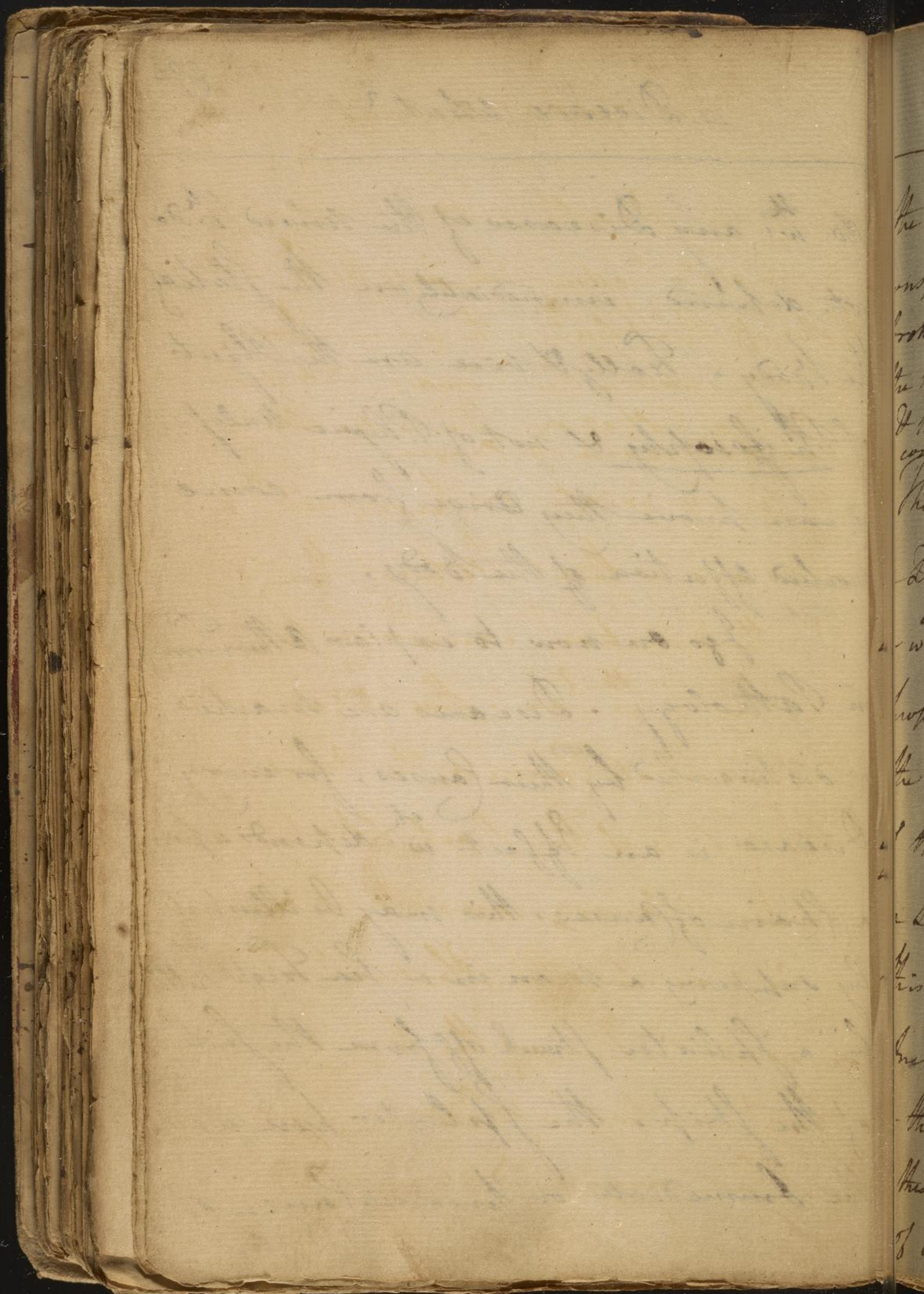


never to be considered properly as Diseases
 since no one is exempted from them,
 & since nature herself quickly removes
 them by the ordinary powers of the
 Economy. I now Repeat again y:
~~add~~ That state of the body only is
 to ^{be} considered as a Disease when y² functions
 of the healthy ~~or~~ body are so inter-
 rupted as to ^{be} performed w: ^{the} ~~unusual~~ ^{unusual} ~~ob~~
 for a considerable time & are obvious
 to our senses. I must add here that
 our notions of Disease must likewise
 include the state of the mind. But
 here too we must allow a *Latitudo*
'Sanitatis' Physic has nothing to



do ^{the} any Diseases of the mind ^{which} do not depend immediately on the state of the body. Truly & vice are the Objects of Philosophy & not of Physic unless we can prove they arise from some morbid affection of the body. —

I go on now to explain Other Terms in Pathology. Diseases are marked or distinguished by their Causes, for every Disease is an Effect ^{which} depends upon a chain of causes. This may be illustrated by supposing a man in a sea fight killed by a splinter struck off from the side of the ship. the splinter here was the Immediate or proximate Cause of

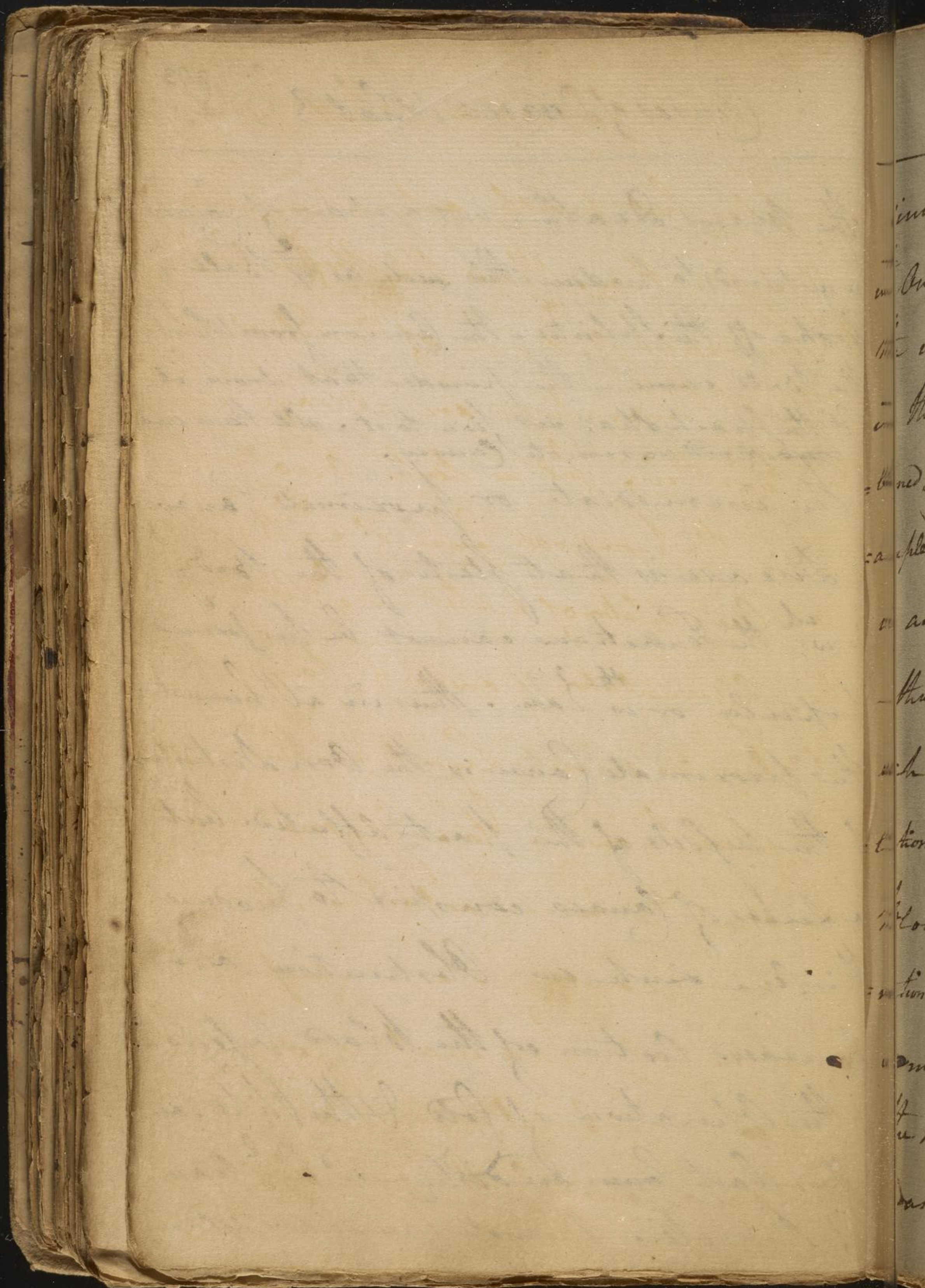


Causes of Diseases What?

293

The man's Death, but a chain of Causes conspired to produce this such as ²Ball ² broke off the Splinter - the Cannon from whence the Ball came - the powder that drove it & the spark that set fire to it. all these are considered as remote Causes.

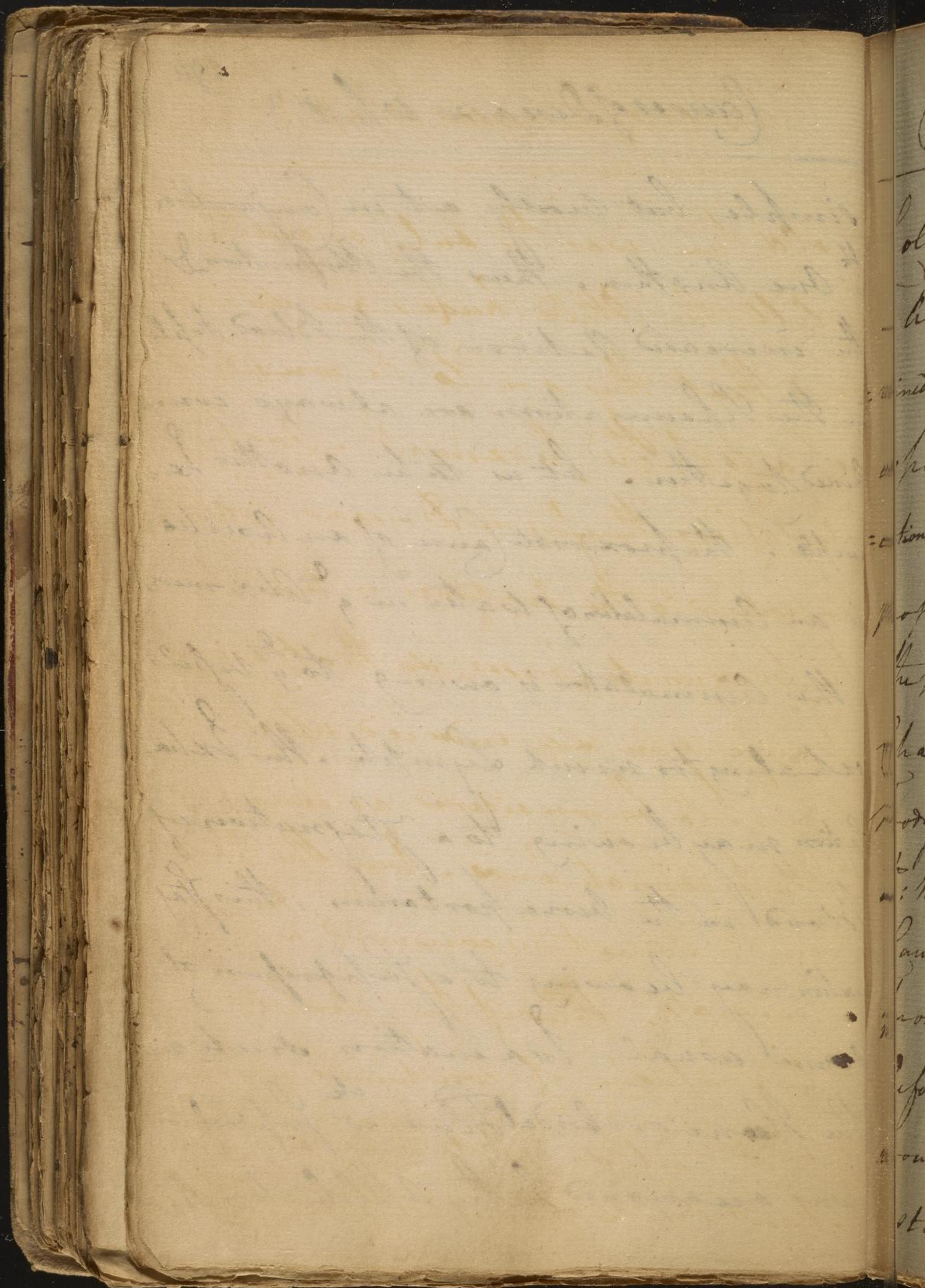
The immediate or proximate Cause of a Disease is that state of the Body in w^{ch} the Functions cannot be performed properly or wth ease. Thus in a Rheumatism the proximate Cause is the Over Distention of the vessels of the part affected. but a series of Causes conspire to produce this one such as Obstruction - an Increased Action of the blood vessels - the Operation of cold & the like. all these last Causes are distinguish^d by name of Remote. Remote Causes are seldom



Causes of Diseases what?

294

simple, but mostly act in conjunction
w: One another. Thus the Absorption &
the increased Action of the Blood Vessels
in the Rheumatism are always com-
bined together. Let us take another Ex-
ample: the proximate Cause of an Ascites
is an accumulation of water in ^{the} Abdomen.
- This accumulation is owing to ^{the} vessels
exhaling too much Lymph. This Exha-
lation may be owing to a stagnation of
Blood in the Vena portarum, this stag-
nation may be owing to a suppression of
some usual Evacuation such as
the Hemorrhoidal Flux ^{the} w: suppression
was occasioned by the Application of cold



Causes of Diseases what? 295

Cold here was the only remote Cause.
— All the Other Causes are so combined that they are to be considered as parts of the proximate. Our Judgments of Cause therefore in Diseases is always proportioned to the Nature or Number of the proximate Causes. so that every Change you see induced upon the Body is to be considered as connected th w: the proximate Cause. Even the Remote Cause is sometimes connected th w: the proximate. Thus if the splinter we before spoke of continues in a wounded part so as to keep up a constant Irritation it is then to be

Causes of Diseases what?

considered as the proximate Cause of it.

In a word then every Cause that gives Rise to an Indication is to be considered as part of the Proximate, & those as Remote ^{ch} w: do not give any Foundation to Indications. Predisposing Causes (of ^{ch} w we shall speak hereafter) may sometimes act as proximate. Thus if a Man from a plethoric state is subject to Hemorrhages, this Plethora is considered generally only as a predisposing Cause but I think it should be considered as part of the proximate Cause as it requires an Indication of Cure to remove it. proximate Causes have

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Causes of Diseases what? 297

Sometimes been called Continent
Causes as comprehending all the series
or chain of causes ^{ch} w^{ch} conspire to
produce the Disease. This certainly
gives us the most distinct view of
the nature of the proximate cause of
a Disease. See Dr Boerhaave's definition
of the proximate cause w^{ch} I think by far
the most unexceptionable ^{ble} of any I have
yet seen § 740. The Causa proxima
is the only true physical cause of a Dis-
ease see Dr Cawley's § 61. & § 74. According
to Woffius the proximate cause of a Disease
is that cause upon w^{ch} the actuality (as
he calls it) of a Disease depends. all the

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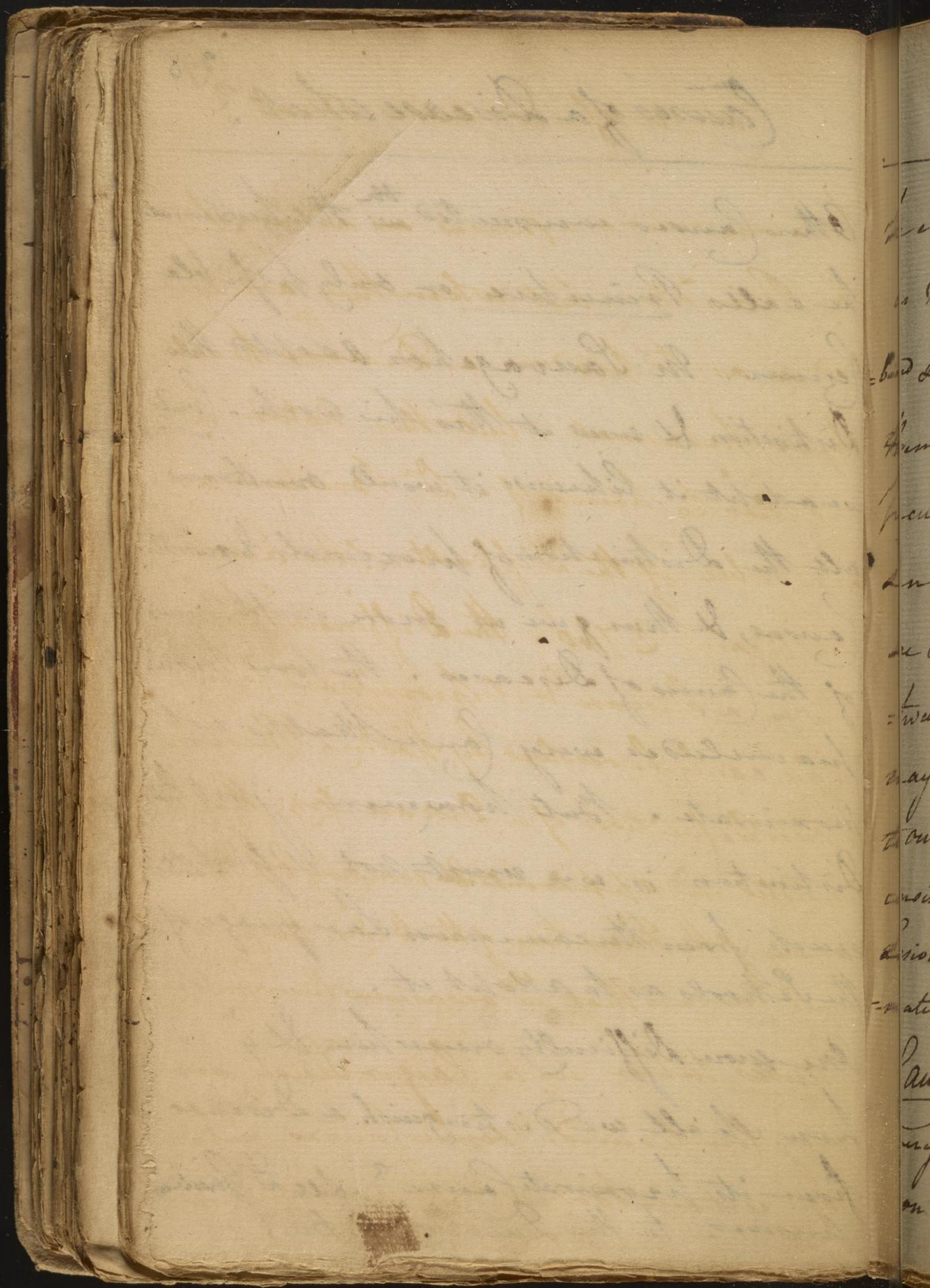
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298

Causes of a Disease what?

Other causes connected th w: the proximate
he calls Principia or only possible
causes. M. Sauvage has adopted this
Distinction & uses it thro' his work. Could
we adopt it likewise it would overthrow
all the Distinctions of proximate & remote
causes, & thus give us more simple Views
of the Causes of Diseases. The word Princi-
-pia includes every Cause that is not
proximate. But however just this
Distinction is we must not dissent so
much from the common Language of
the Schools as to adopt it.

One more Difficulty occurs here & y^r is
how shall we distinguish a Disease
from its proximate Cause? See Dr Gaultier
Answer to this Question 260.



299

Causes of Diseases What?

he considers causes as acting simply
as Remote but when they are com-
bined so as to produce a Disease he calls
them proximate, but this notion is
peculiar to himself. Dr Boerhaave was
sensible of the Difficulty of this Question
see again 2740. The Difference then be-
tween a Disease & its proximate Cause
may easily be resolved by having Recourse
to our Definition of a Disease viz: that it
consisted in 'apparent & uneasy & permanent
Lesions of the Functions of the Body. the proxi-
mate Cause is that ^{wh}ich occasions these Symptoms.

Causes taken in a larger Sense are
very compound. some Causes act only
on certain Bodies, & some Bodies again

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Causes of Diseases what?

can only be acted upon by certain Causes. in the human Body the Body is the Patient, external Bodies are the Agents th w^h act on it, & these Agents will act according to the Condition of the Body.

— If a Body is affected by an Agent that does not act on all human Bodies universally that Body is said to be predisposed to such an Affection, & this Cause is called in Latin "Causa Predisponens"

— These Agents th w^h act only in Cases of Predisposition are called Occasional or provocative Causes. hence Dr Boerhaave speaking

of Occasional Causes says "folis haec sunt predispositis", see also Dr. Gaurius § 59 on the Distinction of these two Causes.

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Causes of a Disease what?

It is not sufficient therefore in enumerating the Causes of Diseases to mention the Occasional ones only. the Remote Causes should always be pointed out likewise as those Causes ^{do} operate alike on all Constitutions without any peculiar predisposition. Thus a certain Degree of Force will produce a Fracture in every Mans skull. here then you see a Remote Cause producing a Disease without any Predisposition. But again a Predisposition may produce a Disease without an Occasional Cause such as a Plethora which often induces a Hemorrhage without any Occasional Cause to excite it in those who are disposed to it.

Concord

It is not sufficient to say
in the course of business
to be successful. One must
have a strong desire to
be successful. One must
be willing to sacrifice
everything for success.
One must be willing to
work hard. One must
be willing to take risks.
One must be willing to
fail. One must be willing
to start over. One must
be willing to persevere.
One must be willing to
fight. One must be willing
to win. One must be
willing to be the best.
One must be willing to
be the first. One must
be willing to be the last.
One must be willing to
be the only one.



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Symptoms of a Disease what?

This finishes our Ac^t of the Causes of Diseases we shall now go on to mention the Terms used to express the Effects of Diseases.

A Symptom is every Apparent Deviation from the usual ordinary healthy state or every Phenomenon ^h does not occur in Health. It is always somewhat externally evident. a Symptom may sometimes be the Disease itself as in the Case of the Loss of Sight - but a Case of this kind very seldom occurs, & even a Loss of Sight is always attended th wth more or less of a preternatural enlargement of the pupil or with Head-ach. a Disease then & its Symptoms may in almost all Cases be distinguished from each Other. See Gaubius § 86.

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Symptoms of a Disease what?

Symptoms have been viewed in different
lights from their Causes & have been divi-
-ded into 3 kinds 1st Symptomata Morbi.

2nd Symptomata Causae & 3rd Symptomata
Aggravationum. The 1st are 1st Symptoms

of the proximate Cause. The 2nd are the
Symptoms of the remote Causes. The 3rd

are secondary Symptoms proceeding from
the two first Symptoms. all three may

be illustrated by taking notice of a
Pleurisy. thus Pain - Fever & Cough

are Symptomata Morbi or Symptoms
of the proximate Cause, but if a lochia
or angina attend, a Pleurisy it is

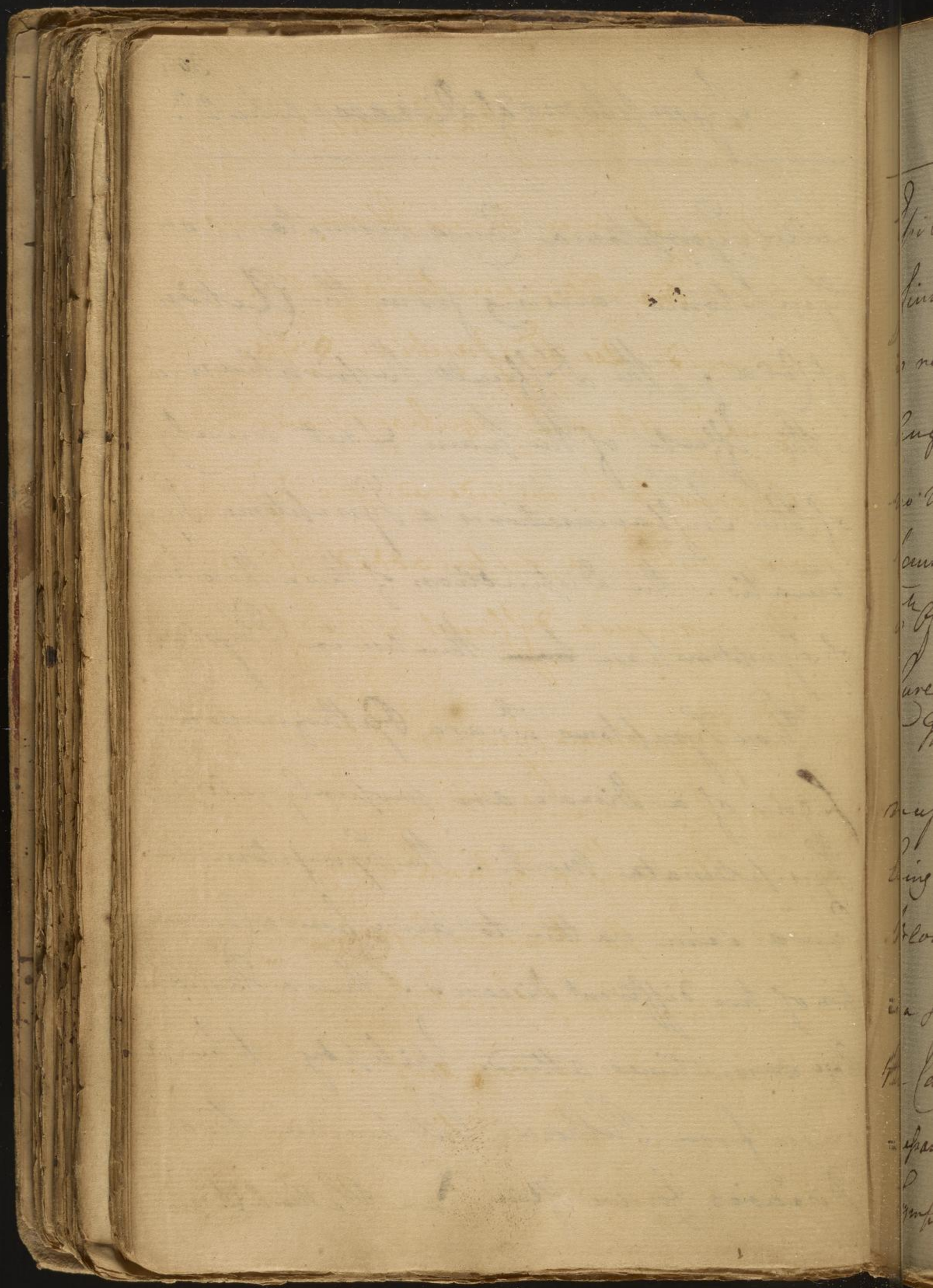
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Symptoms of Diseases what?

called *Symptoma causa remota*, or
Symptoms arising from the Action
of Cold. the Difficult Respiration ^{is}
is the Effect of the Pain & not merely
of the Inflammation is a *Symptoma Sym-*
ptomatis. the Distinction of these three kinds
of Symptoms have ~~been~~ their use in Physic.

— Those Symptoms ^{is} are *Pathognomonic*
Signs of a Disease are properly called
Symptomata Morbi. the *Symptomata*
Causa remota rather to arise from a Conjun-
-tion of two different Diseases. Thus a Hemor-
-rhage sometimes attends Epilepsy when it
arises from Plethora, but here are two
Diseases for we often have Plethora & no



Symptoms of a Disease what?

Epilepsy & vice versa, & we moreover find the one often continues after the other is removed. see De Gaubius § 94. The Angina ^{ca} Attends a Miliary Fever is by no means to be considered as a Symptoma Causae, but as a superadded Disease ^{ca} which often requires a different & particular Cure.

The Symptomata Symptomatum are not necessarily present. Thus a Person from being afflicted ⁱⁿ with a Catarrh may vomit ^{up} Blood. here the Hemorrhage ~~from~~ [&] Lungs is a Symptoma Symptomatum arising from the Catarrh but it does not always necessarily follow a Catarrh. These Symptomata Symptomatum ⁱⁿ Altho' they don't necessarily occur

Wm

William Malcom

Symptoms of a Disease What? ³⁶⁶

are never the less necessary parts in the History of every Disease as they depend ^{on} or arise from the proximate Cause. Sometimes it is difficult to distinguish whether they are *Symptomata Morbi* or *Symptomata Symptomatum* ^{ch} w: show still further the necessity of enumerating them in the History of every Disease. they moreover tend to point out to us the Degree or violence of a Disease.

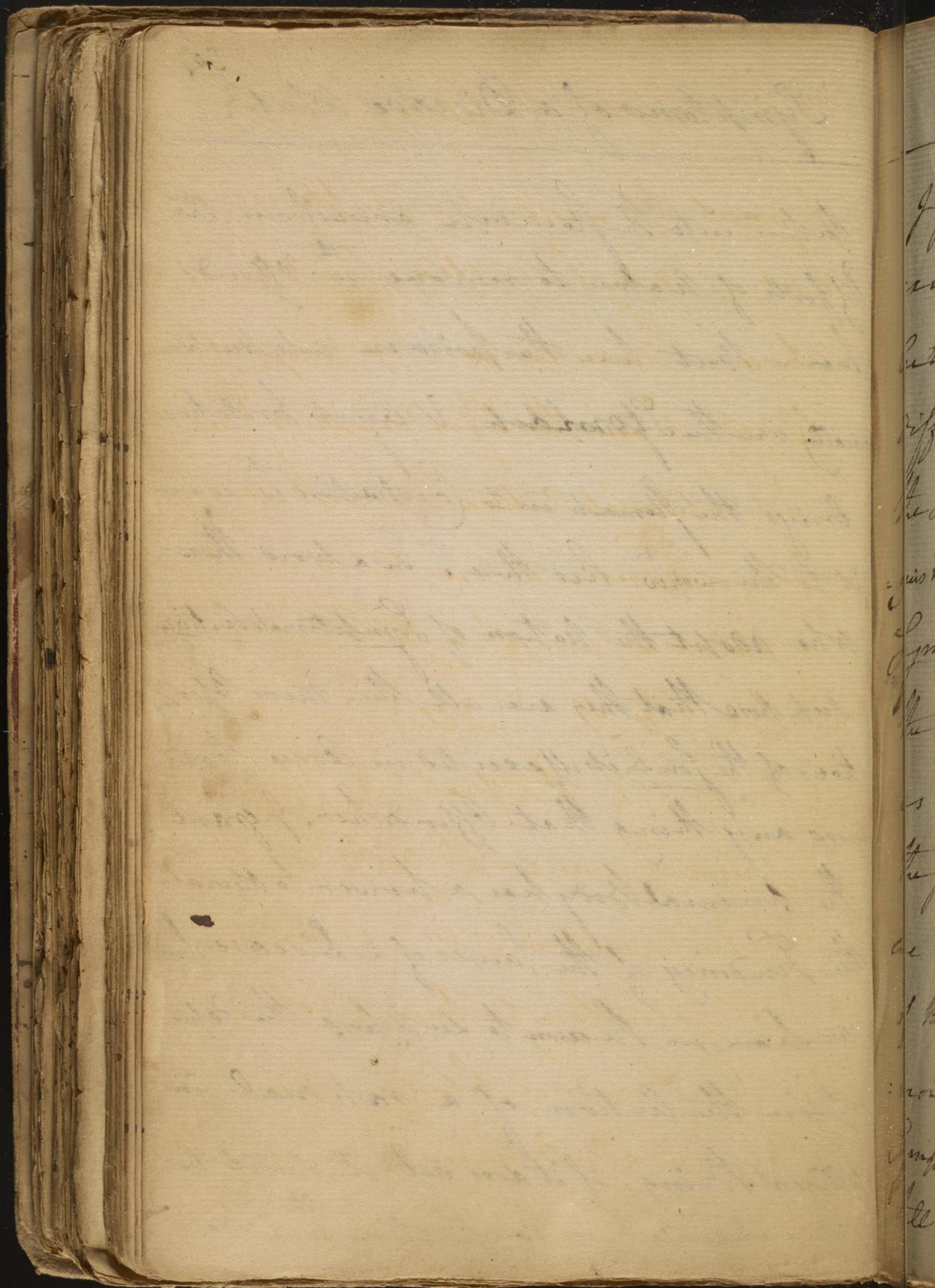
De Gaubius has introduced two other Distinctions of Symptoms viz *Symptomata Activa* & *passiva*. the 1st he supposes to be certain auxiliary Symptoms ^{ch} w: occur from the efforts of Nature to cure herself when diseased. thus vomiting in consequence of something poisonous

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Symptoms of a Disease what?

taken into the stomach arises from the
 efforts of nature to remove ^{it} w: Offends
 her. But here the poison acts Mechan-
 ically on the Stomach, & by its Irritation
 brings the stomach into Contraction w: causes
 it to throw up: lies there. in a word those
 who adopt the notion of Symptomatalectica
 suppose that they are all the mere Opera-
 tions of the soul itself exerted in order to re-
 move any thing that Offends her. I grant
 the Animal Body has a power to obviate
 the Tendency of the Cause of a Disease but
 we have no Reason to suppose this depends
 upon the Action of a rational in-
 telligent Being, if it does act it must be
 Mechanically in Conjunction w: ^{the} Body



Symptoms of Disease what?

I grant likewise such Symptoms do exist as may be called Symptomata ^{activa} ~~activa~~ or Auxillaria ^{activa} which are essentially different from the Symptomata ^{passiva} ~~passiva~~. The Symptomata ^{activa} ~~activa~~ are but distinguished in a Fever. during the cold Pitt ² ~~4~~. Symptoms are merely passive but during the hot Pitt the Symptoms are active as Nature is then making Efforts to remove the Spasm ^{which} causes the Fever. but there are certain Symptoms ^{which} we cannot tell ^{top} ~~to~~ ^{the} ~~of~~ of these Cases to refer them, such as remission &c there are likewise many other Symptoms in all Diseases ^{which} we cannot tell ^{which} ~~if~~ they are, whether they are active

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Symptoms of Diseases what? 309

or passive. But there ^{are} other symptoms
to be taken notice of besides these. A
man who is already afflicted wth a disease
is liable to be afflicted wth any other acci-
dential Cause w^{ch} may cause a new Dis-
ease. Thus a man in a Fever may
receive a Blow in his Head w^{ch} may
bring on a Train of Anomalous Sym-
ptoms. Now these Symptoms are called
"Symptomata Fortuita", & sh^d be closely
attended to, as they are either Nocen-
tia or Ludentia. Upon this Acc. Sym-
ptoms are distinguished into Essential and
Accidental or according to Dr. Gaubius
into "necessaria" & "non-necessaria".

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310

Symptoms of Diseases what?

But Further a Disease we said con-
sisted in a Concurrence of Symptoms.
— but these Symptoms vary exceedingly
during the Course of a Disease, hence they
may have been again divided into
"Simultanea and Perpetua" the first
occurs mostly in the Beginning of a
Disease. the last more properly characterise
a Disease.

This finishes our Explanation of the Terms
of Pathology. we shall now proceed
to the Division of the Institutions of Patho-
logy. we shall therefore in our present
Lectures begin

1. By considering the proximate

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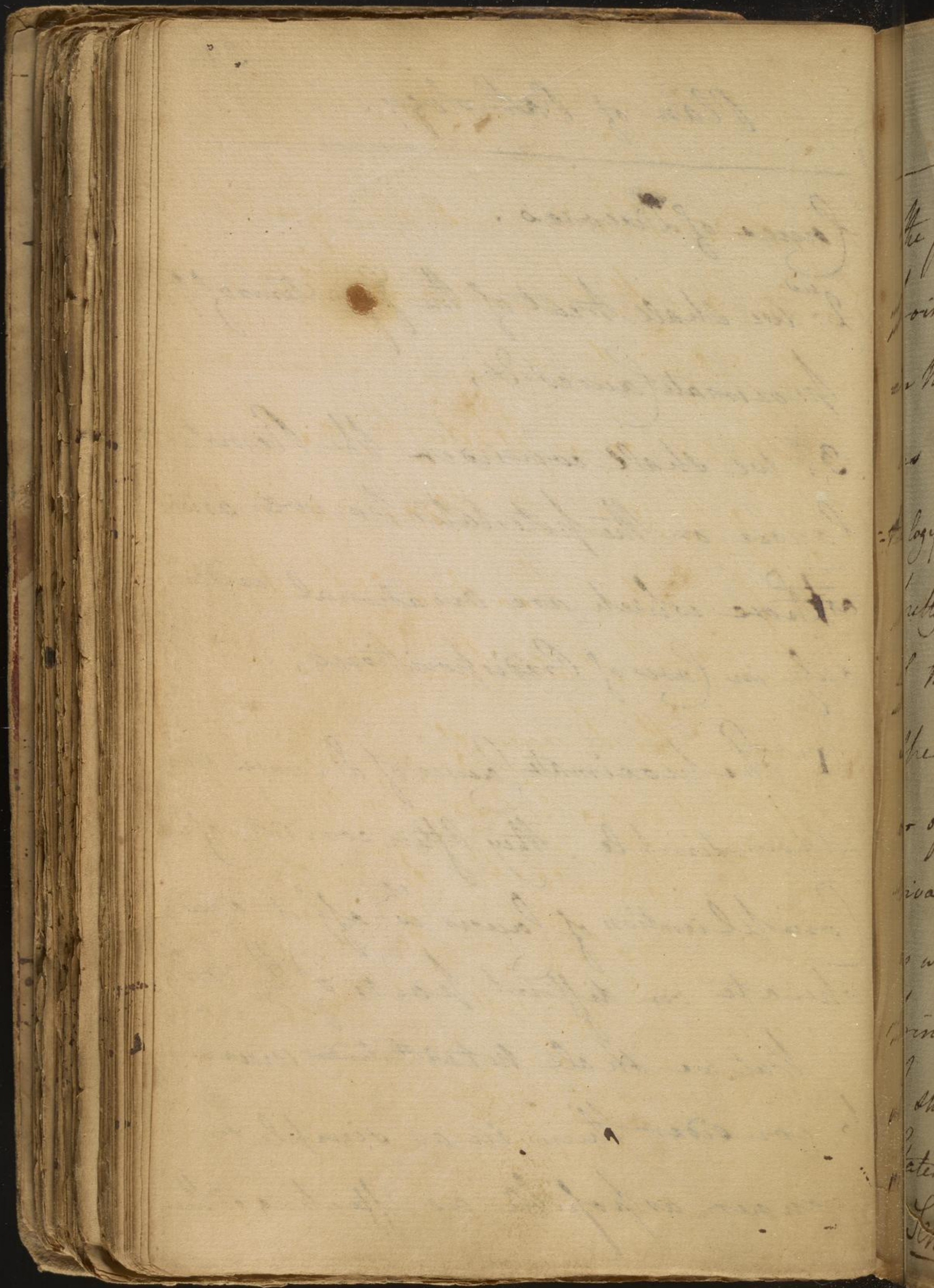
Plan of Pathology.

Cause of Diseases.

2nd we shall treat of the Symptoms of 4th
Proximate Causes &

3rd we shall consider the Remote
Causes or the potestates *horrivæ* as well
as those which are occasional and act
only in Cases of Predispositions.

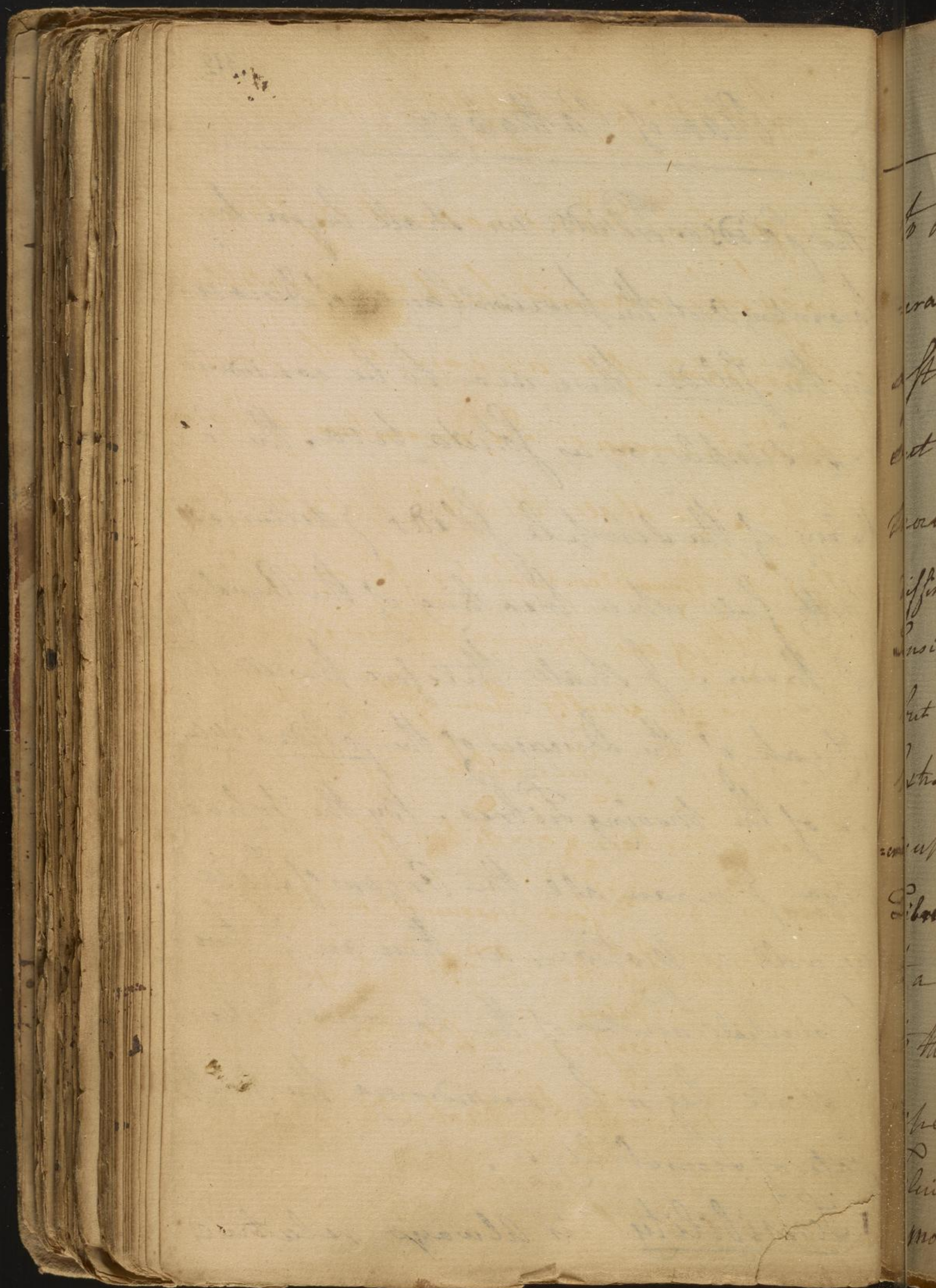
I The proximate Causes of Diseases are
seldom simple. They often consist of a
Complication of Causes w^{ch} affect and
operate on different parts of the Body.
— But we shall notwithstanding endeavour
to consider them in as simple a
Manner as possible as affecting either



Plan of Pathology

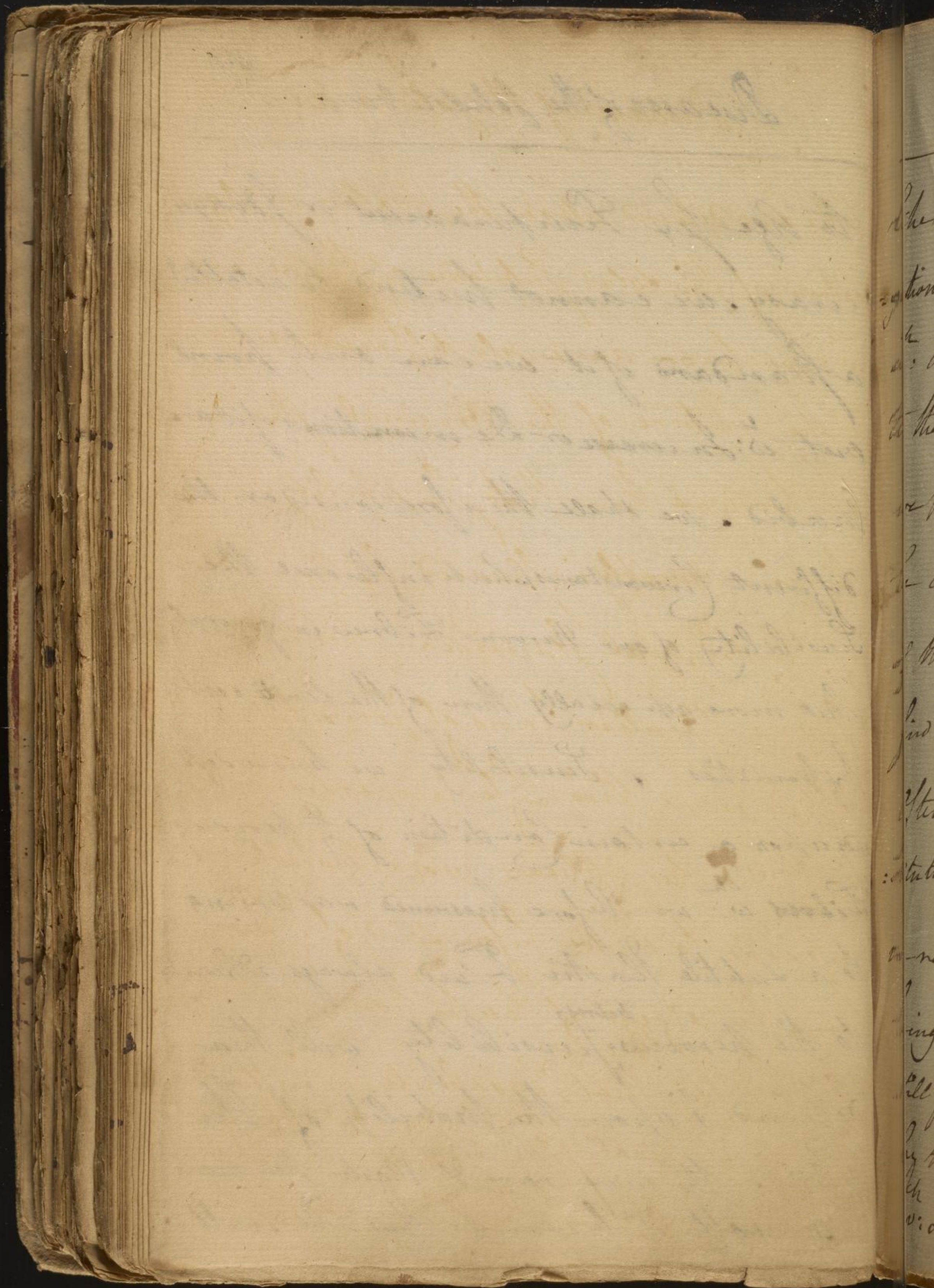
the Solids or Fluids. we shall begin by pointing out the proximate causes of Diseases in the Solids. These are to be considered as simple, or as solida viva, the Pathology of the simple solids I delivered pretty full when treating of the Physiology of them. I shall therefore proceed to speak of the Diseases of the solida viva or of the moving Fibres. By the solida viva I mean all the Organs of Sense as well as Motion, as there are $\frac{2}{4}$ two principal Functions of the Nervous System. I shall begin by considering the Morbid States of Sensibility.

I Sensibility is always relative



Diseases of the Solida Viva.

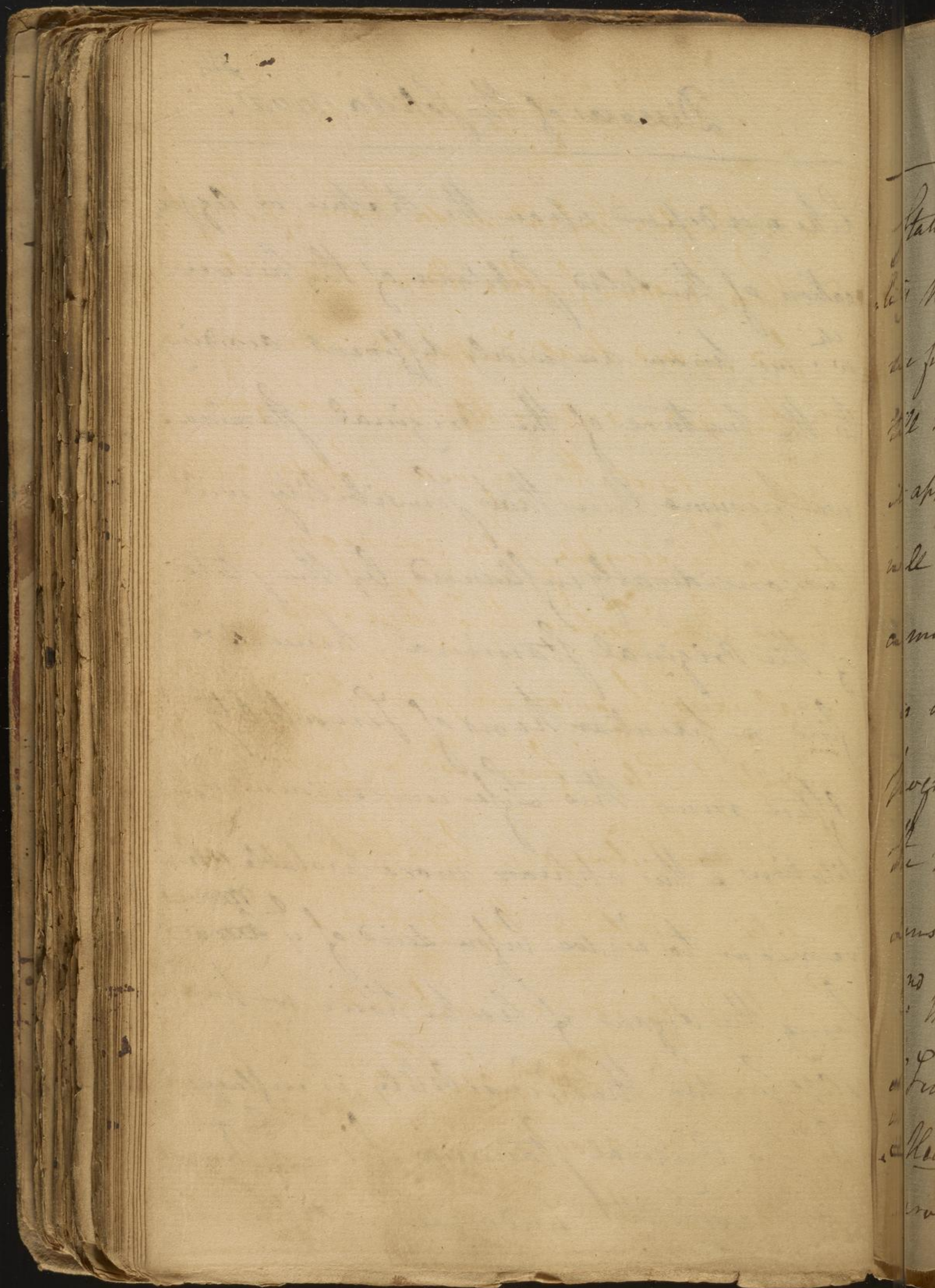
to be by Temperament or Idiosyncrasy. we cannot pretend to establish a standard of it. we can only point out its Increase or Diminutions of it are morbid. we shall therefore consider the different Circumstances which influence the Sensibility of our Nervous Fibres in general, but more especially those of the sensitive Extremities. Sensibility we know depends upon a certain Condition of the Nervous Fibres ^{as} we before presumed was owing to a subtle Plastic Fluid always adhering to the nervous ^{Fibres} Sensibility will then depend ^{on} upon the Mobility of this Fluid. the more rare & Plastic the more moveable it becomes. this Fluid will



314

Diseases of the Solida Viva.

likewise depend upon the nature or aggregation of the solid substance of the nerves, ^{ch} we know are widely different according to the nature of the Original Stamina. we presume then that Sensibility will be considerably influenced by the state of the Original Stamina. hence we find a peculiar kind of Sensibility often runs thro' Life in certain Constitutions. this appears more probable when we recur to ² nerves we before said of ~~the~~ ² being the Organs of Nutrition. we presume still further that Sensibility is influenced by the Original Stamina from ² changes ^{ch} ² Sensibility undergoes in different



Diseases of the Solida viva.

States of Life. Infants we see have less Sensibility than Children farther advanced in Life. we find indeed that Sensibility is increased till the body arrives at its home, from ^{wh} it appears that the nervous substance as well as the simple solids are acquiring a more firm Texture thro' time. The brain is always heavier in proportion to the progress of Life, from ^{wh} we infer that the nervous Fibres are likewise acquiring Density as well as the brain.

2nd External bodies influence the state of Sensibility such as Heat & Cold. a Heat first excites the Mobility of the nervous Fluid & very considerably influences

(a) " The Ignorance of the Africans & other
nations who live under the Line may
be attributed to other accidental Causes
rather than to the Heat of their Climates
affecting the Vigour of their Faculties. "

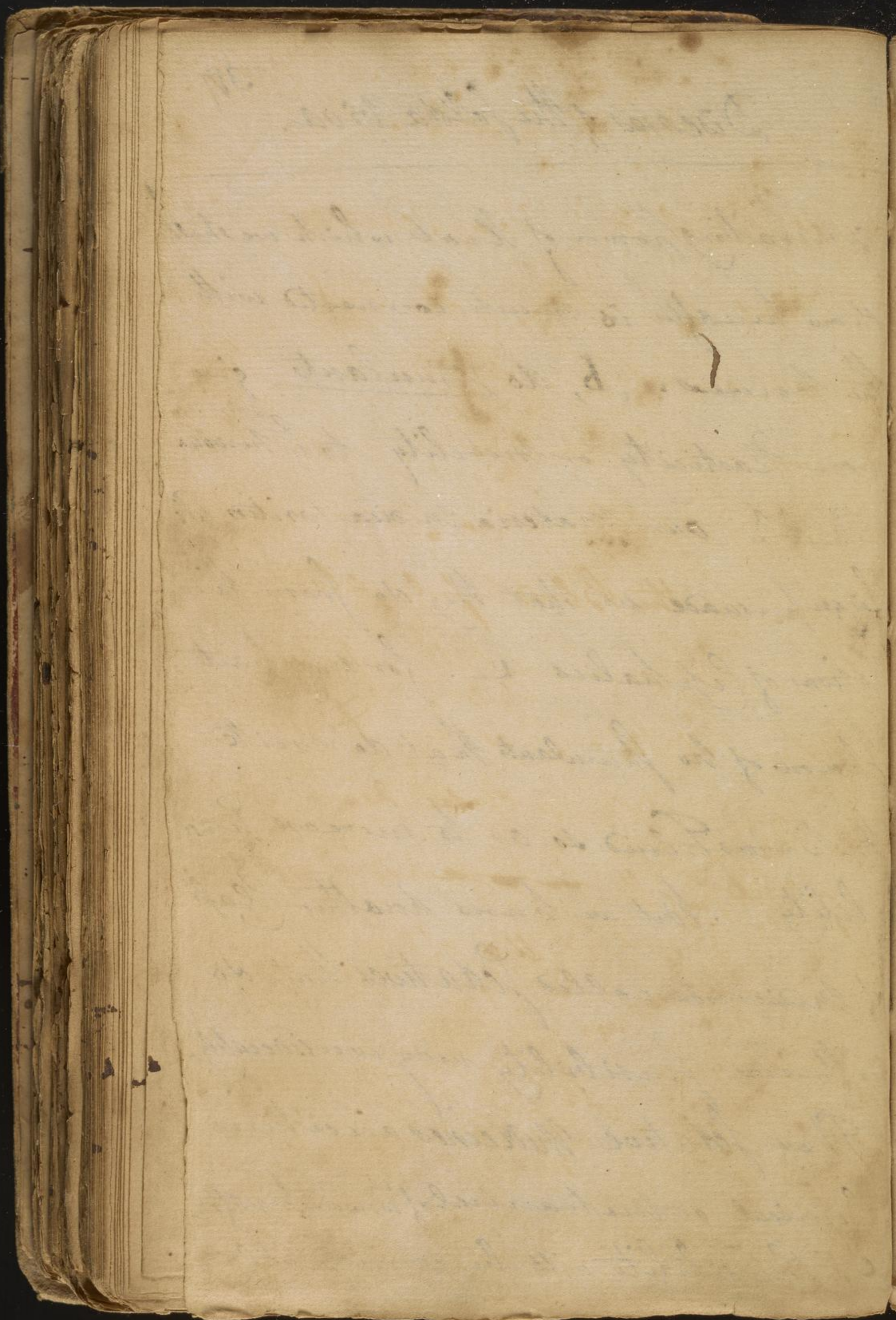
Diseases of the Solida viva.

^e different states of Sensibility in ^{the} nerves.
 - in general we find it increased by
 Heat: hence Constitutions are most
 sensible in warm Climates, & ~~most~~ ^{the}
 People in hot Countries are always endowed
^{the} with more exquisite Sensibility in Regard to
 every thing than those who live in cold
 Climates. But again all Constitutions in
 every Climate are more sensible in summer
 than winter. There is a certain Degree of
 Heat ^{the} which is most favourable to Sensibility
 in our nature that every Degree of Heat which
 passes beyond it rather diminishes Sensibility
 It is equally unfavourable to our Functions
 with Cold. It moreover takes off from the

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generating power of Heat which we shall
show hereafter is much connected with
the Nerves. B, do Stimulants give
more Elasticity or mobility to the Nervous
Fluid? Our Materia Medica written w.
Ligon persuade us that they do from their
Notions of Cephalics &c. For my part
I know of no Stimulants that do excite
the Nervous Fluid so as to increase Sensi-
-bility. But we know another Class
of Medicines called Sedatives that do
influence Sensibility very considerably.
- These Sedative Medicines are either
Chemical or Mechanical of w. more hereafter.
C, Sensibility will be considerably



Diseases of the Solida viva

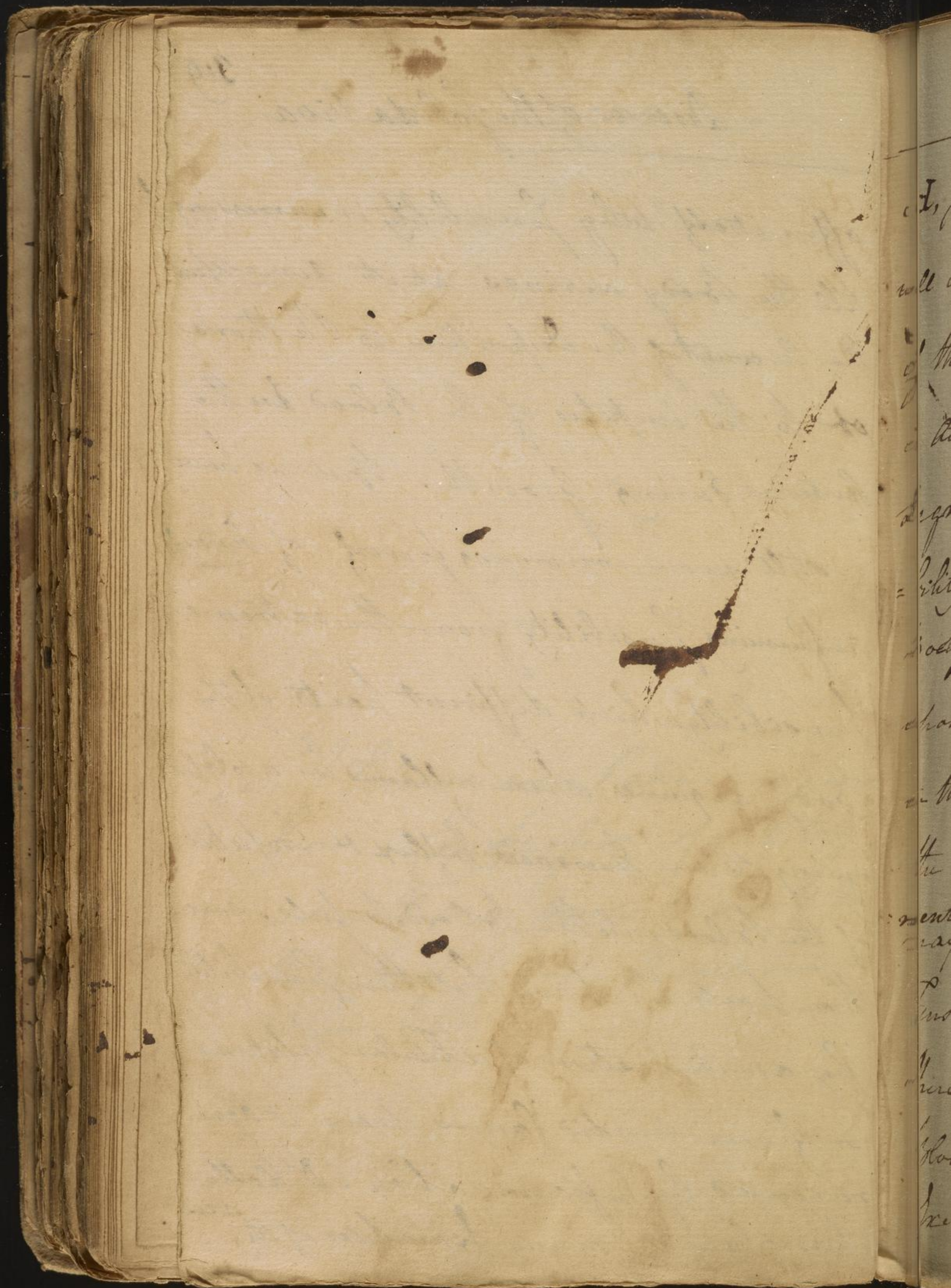
influenced by the state of Tension in the
 fortient Stemities. Nature has taken
 great pains to promote & keep up this
 Tension in the Extremities of the nerves
 by the uniform manner in w^h she has
 distributed the Blood vessels along wth
 the nerves. even in the Retina itself
 a layer of Blood ^{vessels} has been discovered.
 - They are likewise to be demonstrated
 very plentifully in ~~the~~ accompanying
 the minute papillæ of the Tongue.
 - We may presume from this that all
 the nerves in like manner are equal-
 ly accompanied wth Blood vessels. Sensib.
 will therefore depend upon the Tension
 of these Blood vessels hence Another Reason

(a) "I believe even Palsies may arise
from a Compression of an artery
as well as a nerve so much does
the arterial blood influence Tension
& sensibility."

Diseases of the solida viva

319

offers itself why Sensibility is increasing till the body arrives at its Acme upon the Account of the Disposition to Plethora or to the impetus of the blood in the Arteries during Growth. But we have a still more convincing proof of Fension influencing Sensibility from the extreme Sensibility which different parts of the body acquire when inflamed ^{ch} is solely owing to an Increased Influx & Impetus of the blood into the blood-vessels. even those parts ^{ch} have lost their Sensibility by an Accretion of cellular substance or from morbid Causes have it again renewed by Inflammation. Dr Haller has given us many Examples of this. ^{also}

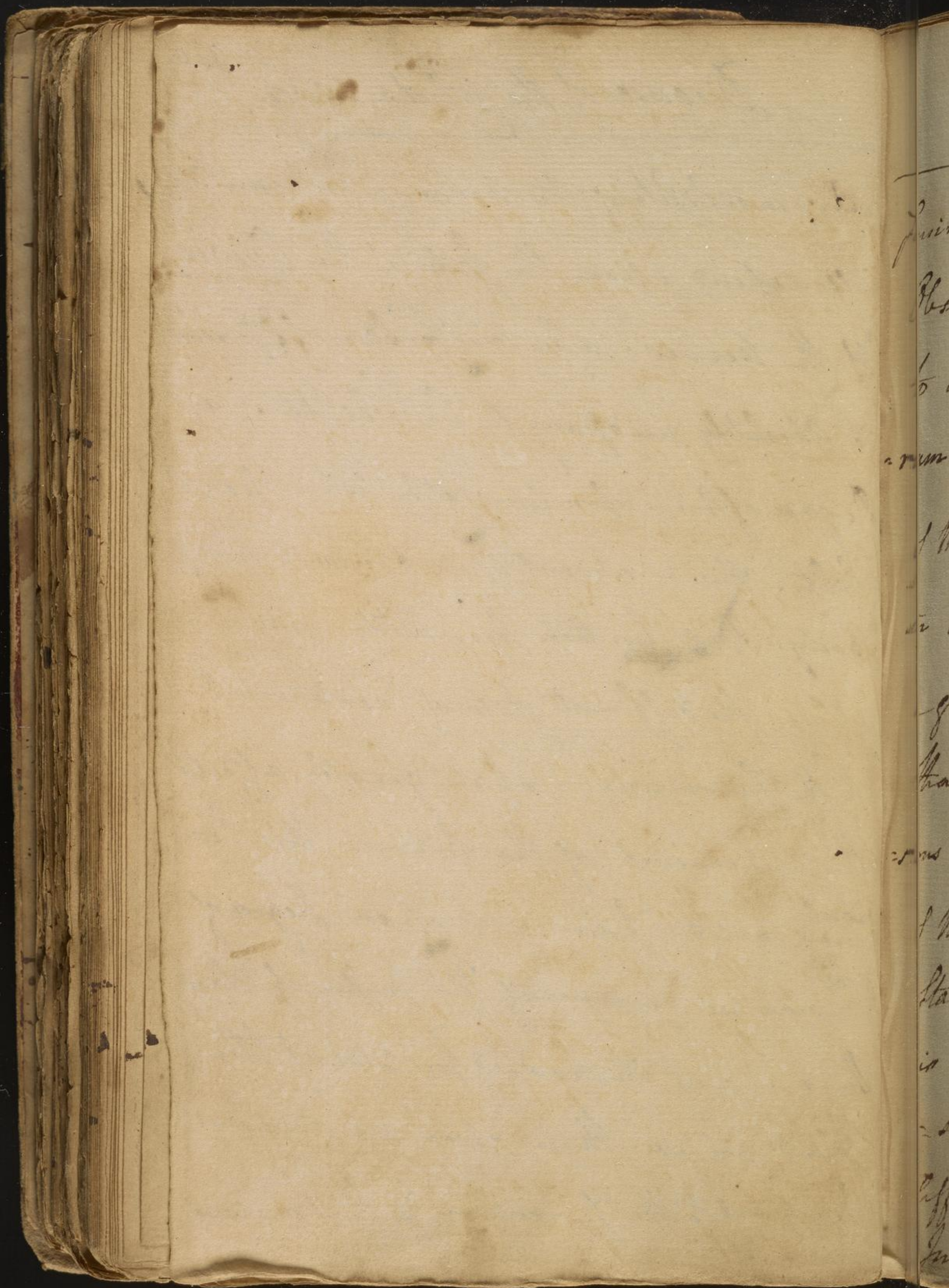


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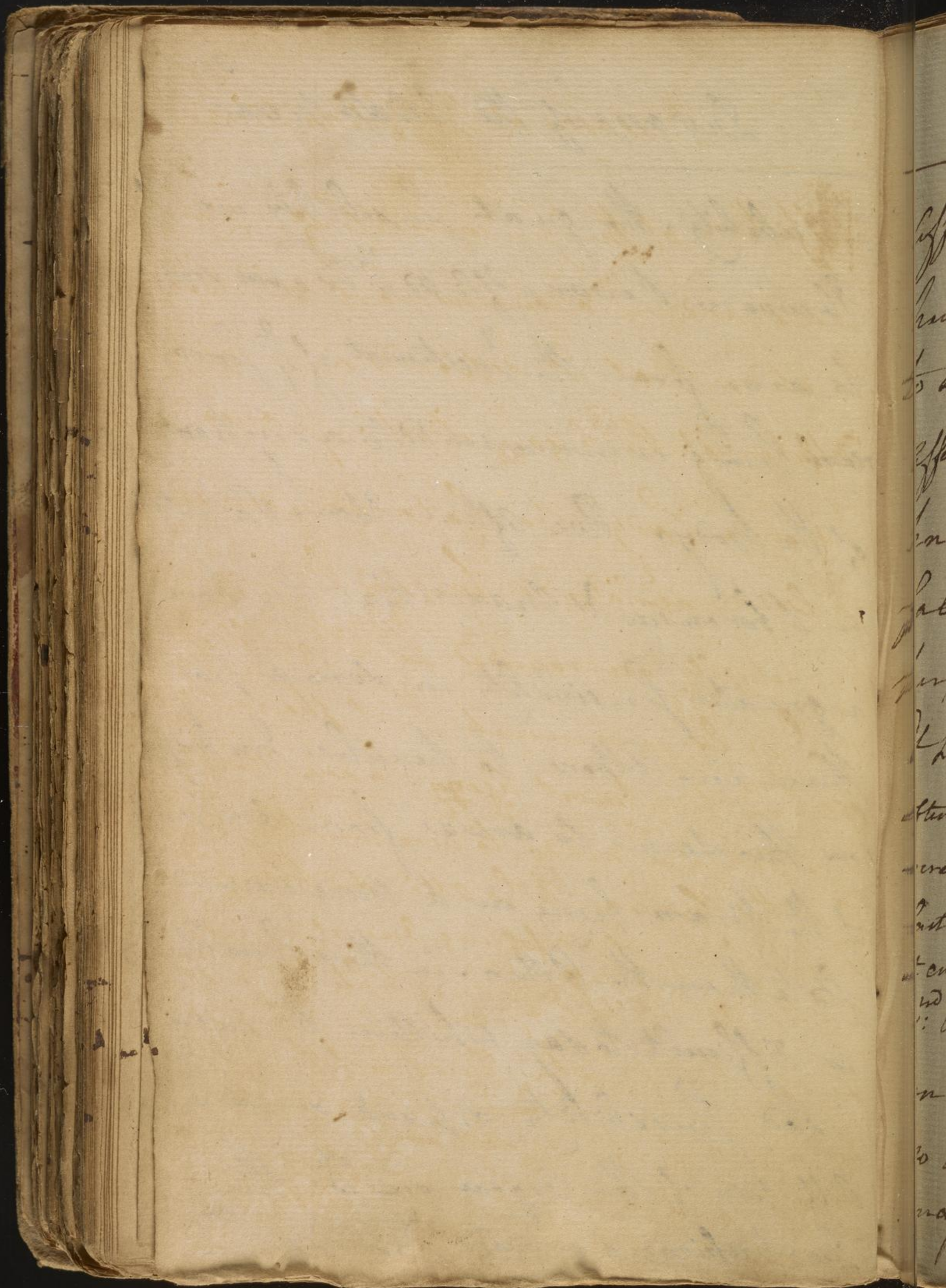
Diseases of the folida viva.

d, sensibility of the nervous Extremities will depend upon the state of the Origin of the nerves. a certain Freedom of ^{sum} sensorium is Absolutely necessary to sensibility. a Degree of Compression immediately takes off Sensibility. This is evident and obvious to every Body. But further Sensibility may depend upon the different states of Excitement in the sensorium, which greatly affects the Extremities of the nerves. This Excitement may arise from a proper Degree of Tension in consequence of the Influx of Blood there. an increased Impetus of the Blood we see then gives an additional Excitement to the sensorium, & thus increases



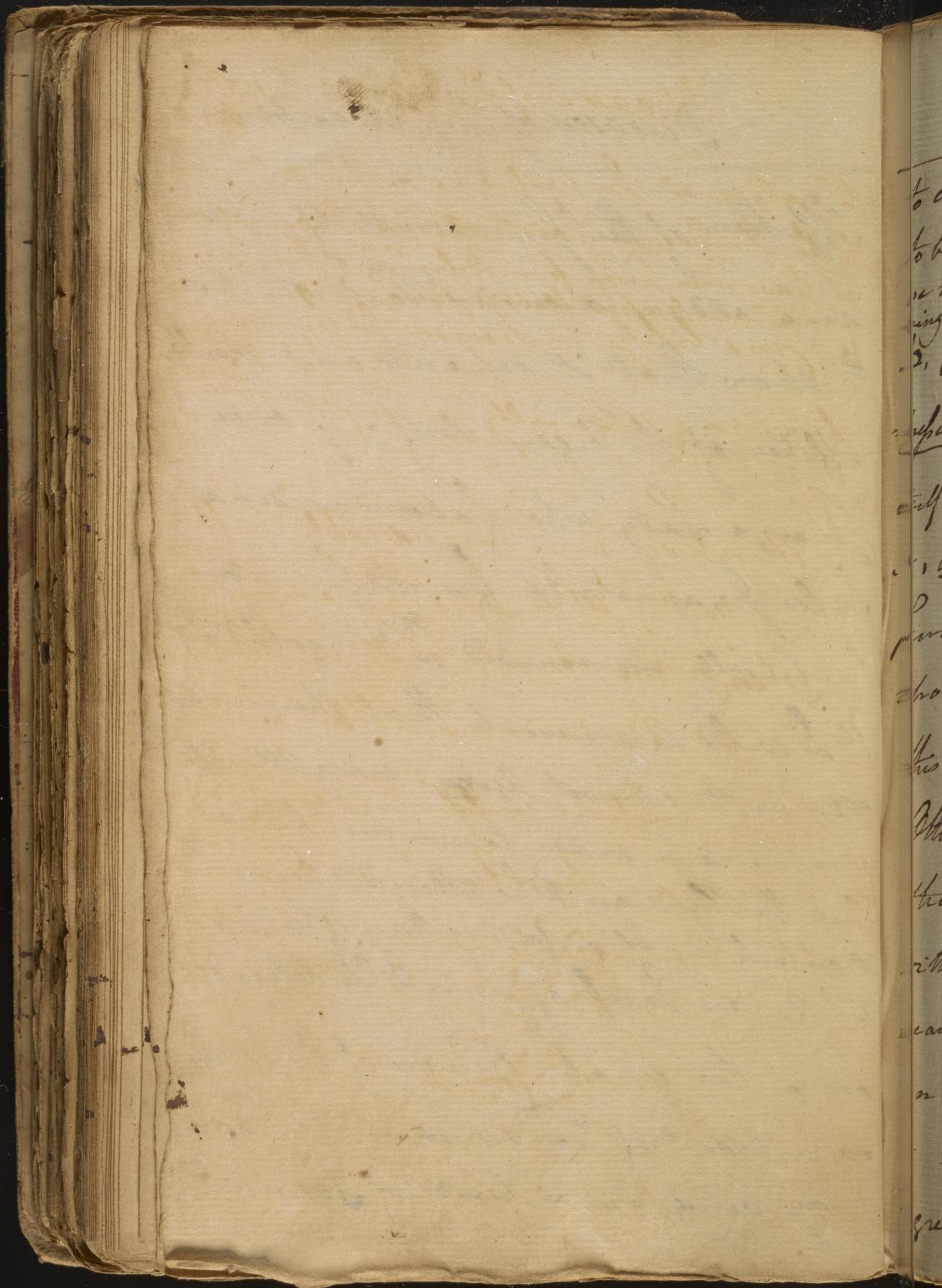
Diseases of the foliæ viva

Sensibility. The great sensibility we
 observe in Persons afflicted wth it seems
 to arise from the excitement of y^e senso:
 -rium being communicated to every part
 of the body. We often observe Patients
 in Phrensies & Manias that they have
 a greater sensibility in some parts
 than in others to peculiar Im. pres-
 sions this seems to arise from one part
 of the Brain being in a more excited
 state than the other. in these cases it
 is difficult to say whether the incre-
 -sed sensibility depends on an
 affection of the Organ on w^{ch} the
 Impressions are made, or upon an



Diseases of the Solida biva

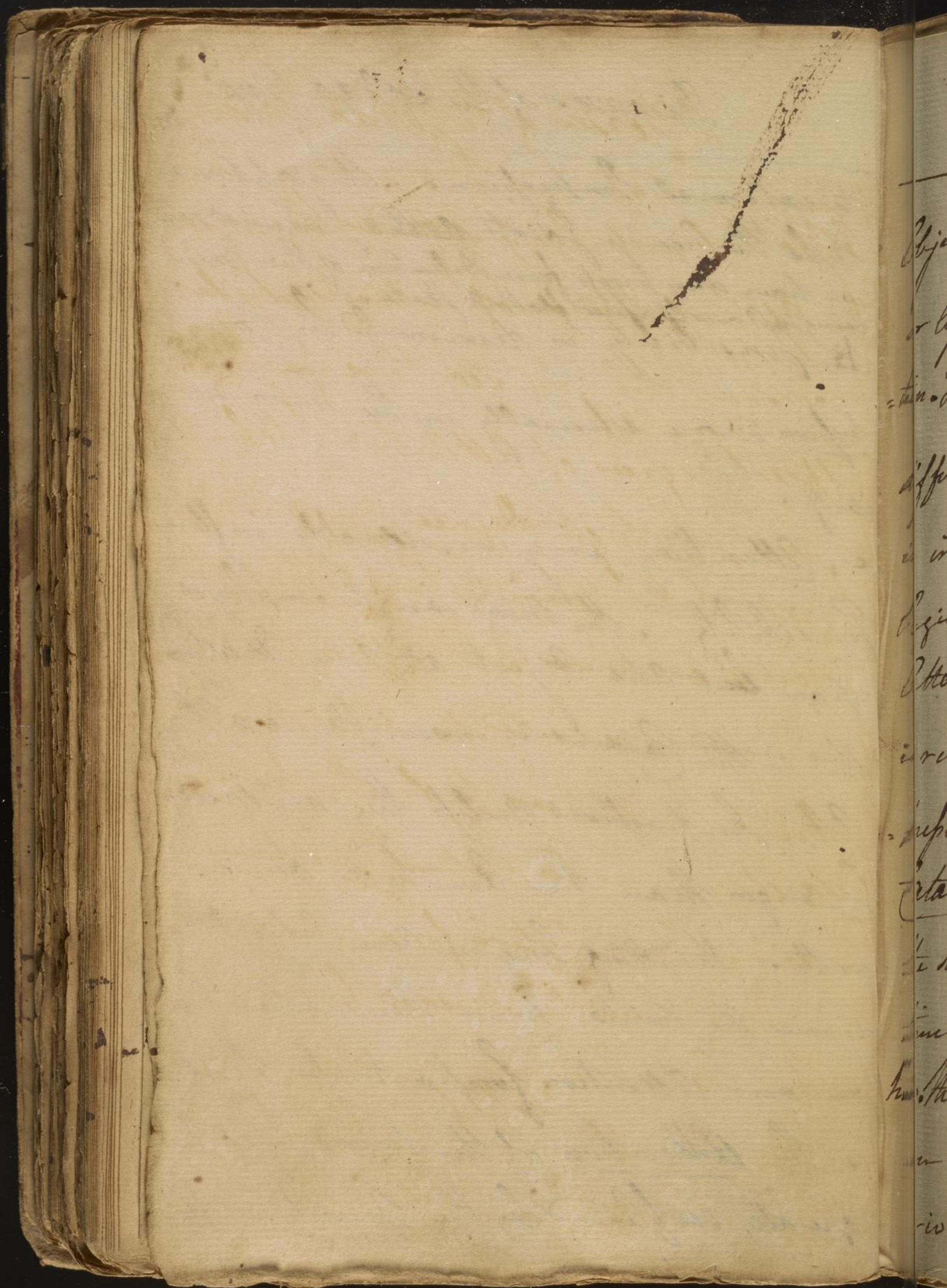
Affection of the Sensorium itself. I can
 here add a curious Fact which serves
 to show that it depends on a morbid
 affection of the Organ itself. I once
 knew a Lady who laboured under a
 false Imagination & fancied she was
 perpetually surrounded wth Hologoblins
 & Devils in so much that she cried out
 often in the utmost agony. many Attempts
 were in vain made to cure her, till at
 last the Physician who attended her removed
 it entirely by blind-folding one of her Eyes.
 2nd As an excess of sensibility depends
 on a too great Tension of the Brain
 so a want of Tension in the Brain
 may bring on a want of Sensibility



Diseases of the Solida Viva

to external Impressions. This appears to be the case in Idiots, altho' I cannot say we have any proof from Dissection of their Brain's being in a collapsed flabbid state.
b. Sensibility is diminished by Com-
pression more especially in the sensorious itself.

c. Attention very considerably influences Sensibility. The mind can be employed upon but one Object at once & when this is the case it is insensible to all other Impressions unless they are much stronger than the one he is occupied with. Thinking long on one Subject wears the mind, hence there is a Remission in our Attention from particular Objects.
 - The Attention of the mind will be greatly influenced by the novelty of the



Diseases of the folida viva.

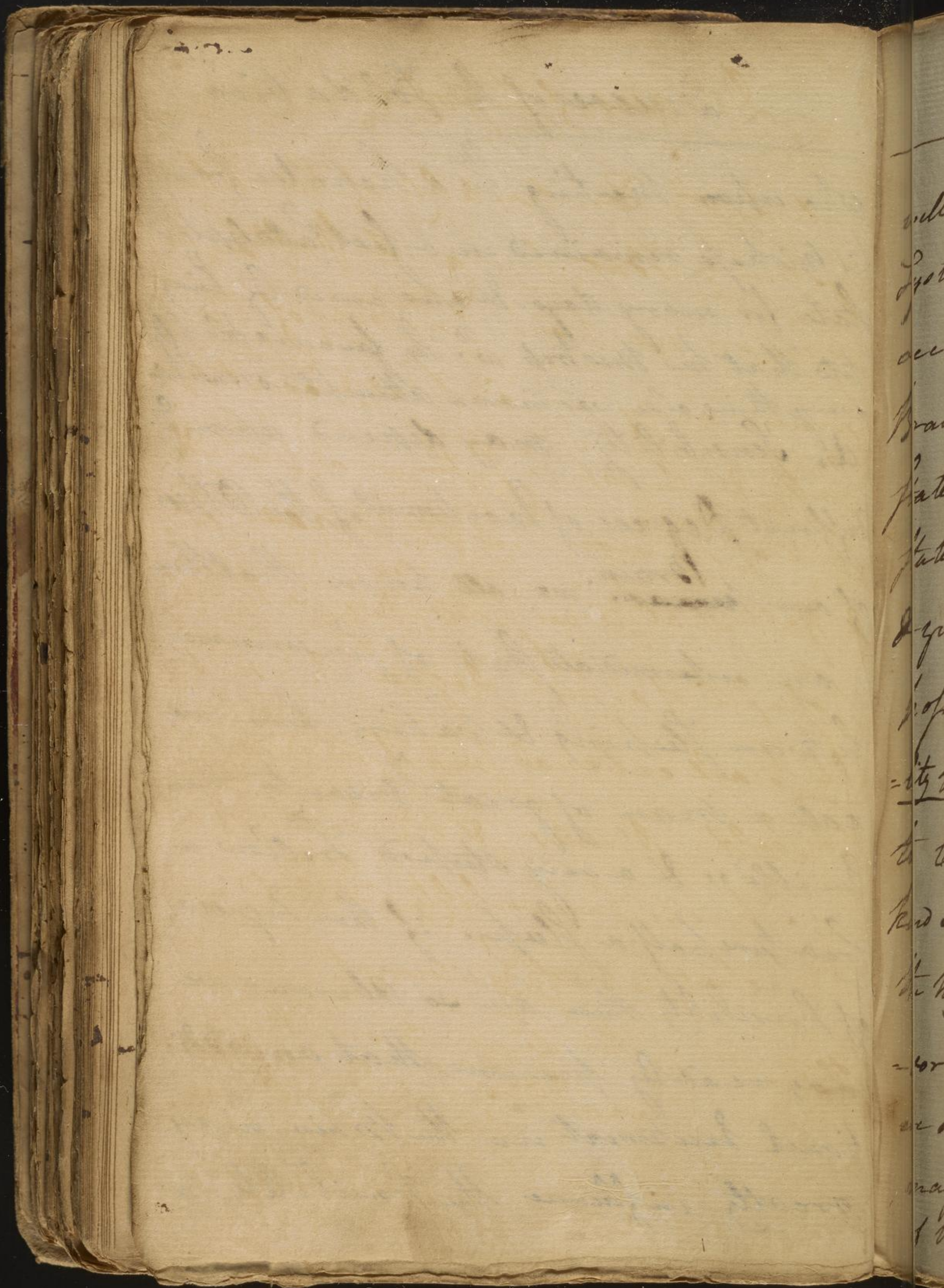
Object by its being attended wth more
or less volition or of interesting Rela-
tion. From this you see there may be
different Degrees of Attention. When it
is in a very high Degree it induces a
Rigidity in the Brain in so much that the
Attention continues even after the Object
is removed w^{ch} excited the Original Im-
pression. This appears to be the Case in
Catalepsy in w^{ch} the Patient continues in
the same rigid Posture for a considerable
time in which the Disease first seized
him. These Catalepsies are generally bro't
on by very fixt Attention. Fulpius
gives us a remarkable Case of a Man

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Diseases of the Solida viva

who upon meeting wth a Repulse from
his Mistress remained in a first Cataleptic
state for many days, & was cured by being
told that his Mistress w^{as} he favourable to
every thing else was in vain attempted to rouse him.
& d. Sensibility may depend upon y^e

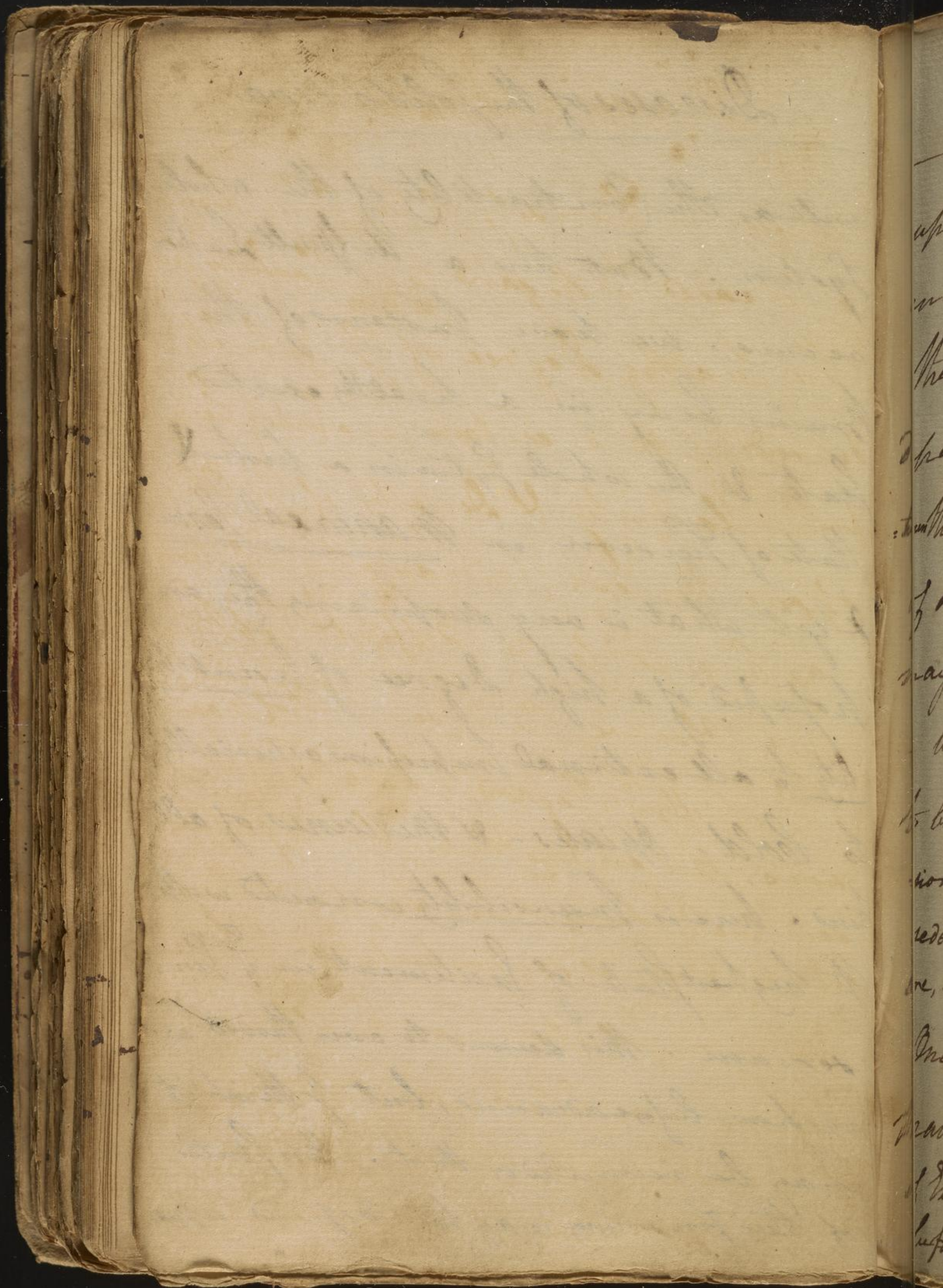
different Degrees of Excitement of the Other
of our ~~members~~ Brain. we all know that there
is an intermediate state of Sensorium
between sleeping & waking. hence we
call a man of great vivacity "bien
veillant" & a very stupid Fellow a
Creature half a sleep. if these Degrees
of Sensibility then are so obvious we
may readily presume that an addi-
tional Excitement in the Brain may
greatly influence the Sensibility as



326

Diseases of the Solida viva

well as the Contractility of the whole System. But here a Difficult Question occurs. we have Instances of the Brain's being in a healthy excited state, & the whole System in a profound state of Torpor in Maniacal Persons & yet what is very surprising they are possessed of a high Degree of Insensibility to all external Impressions especially to Cold - Opium - & Medicines of all kind. here is Insensibility connected with the highest state of Excitement in the Sensorium. This seems to overthrow what we have before advanced, but I think it may be reconciled with it. This state of the Sensorium may then depend upon

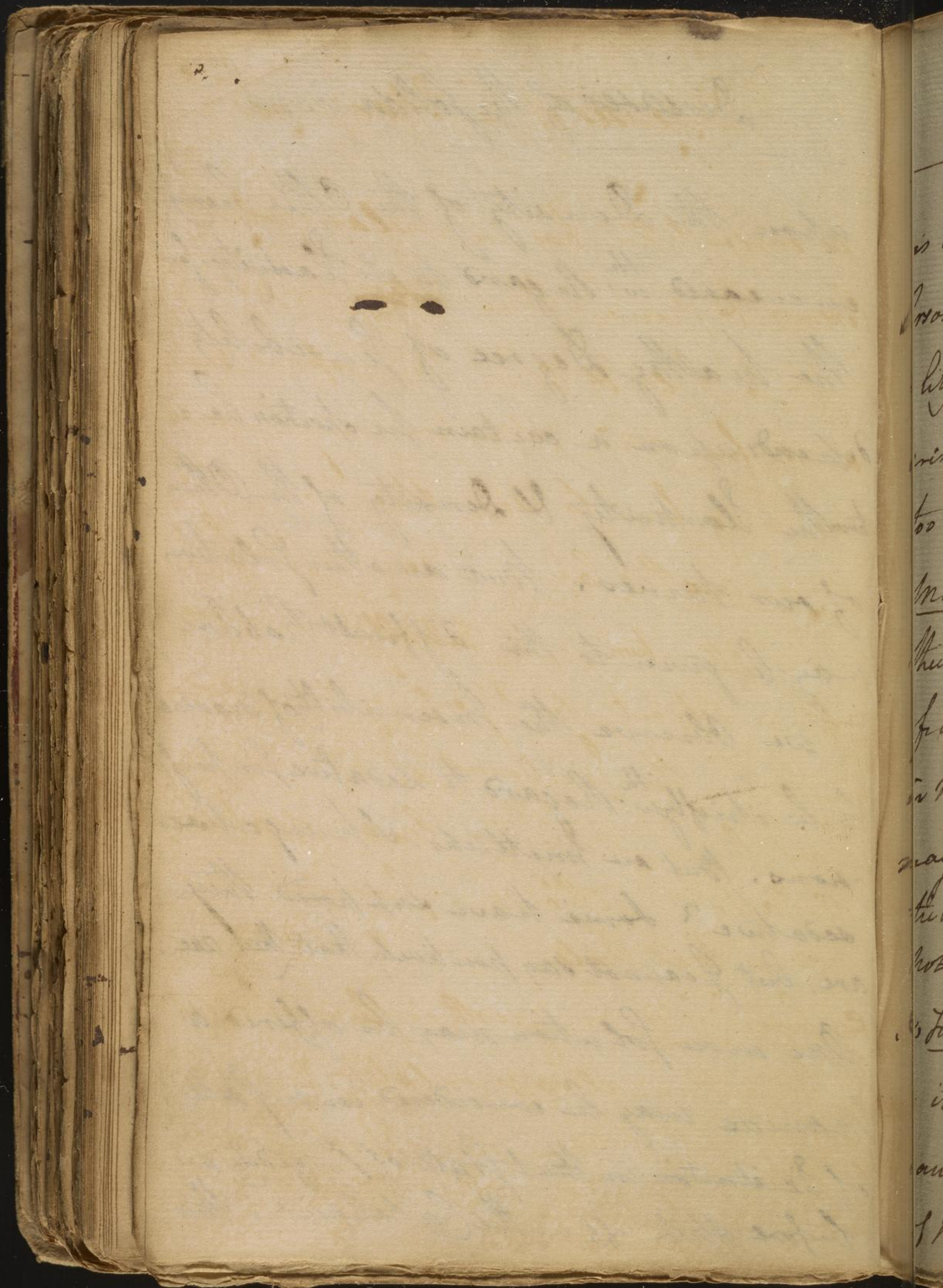


327

Diseases of the solida viva

upon the Density of the Other being
increased wth regard to its Elasticity, for
the healthy Degree of Sensibility
depends upon a certain proportion be-
tween the Elasticity & Density of the Other
of our nerves. But another solution
may be given to this difficult Problem
- we observe the Insensibility of Maniacs
to be chiefly wth regard to sedative impres-
sions. But are Imitations - Spurgatives
sedative? Some have supposed they
are, but I cannot say positively that they are.

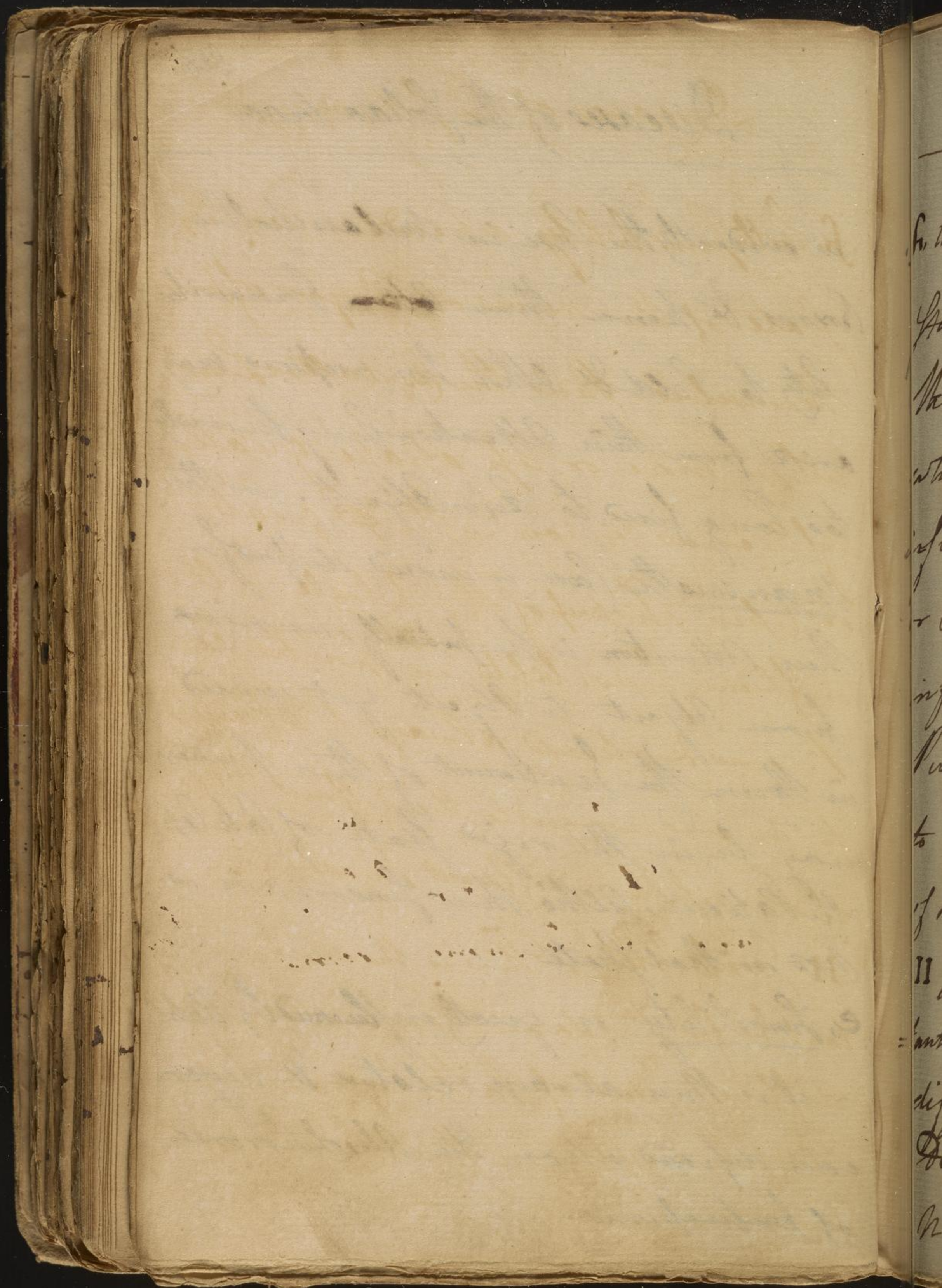
One more solution may be offered - a
Maniac may be considered in a state
of excitement or in that state of Rigidity we
before spoke of in the Cataplexies. This



Diseases of the Solida viva

is evidently the Case in Melanchollic
Persons. & hence their ~~Other~~ Insensibi-
-lity to Cold & Other Impressions may
arise from their Attention being previously
too long fixed to One Object. in the
Maniac the Case is indeed different for
their Attention is perpetually running
from Object to Object yet indeed
in them the Excitement of their Nerves
may be in the rigid state of Cataplex-
-ic Patients, Altho' their Sensorium is
not in that state

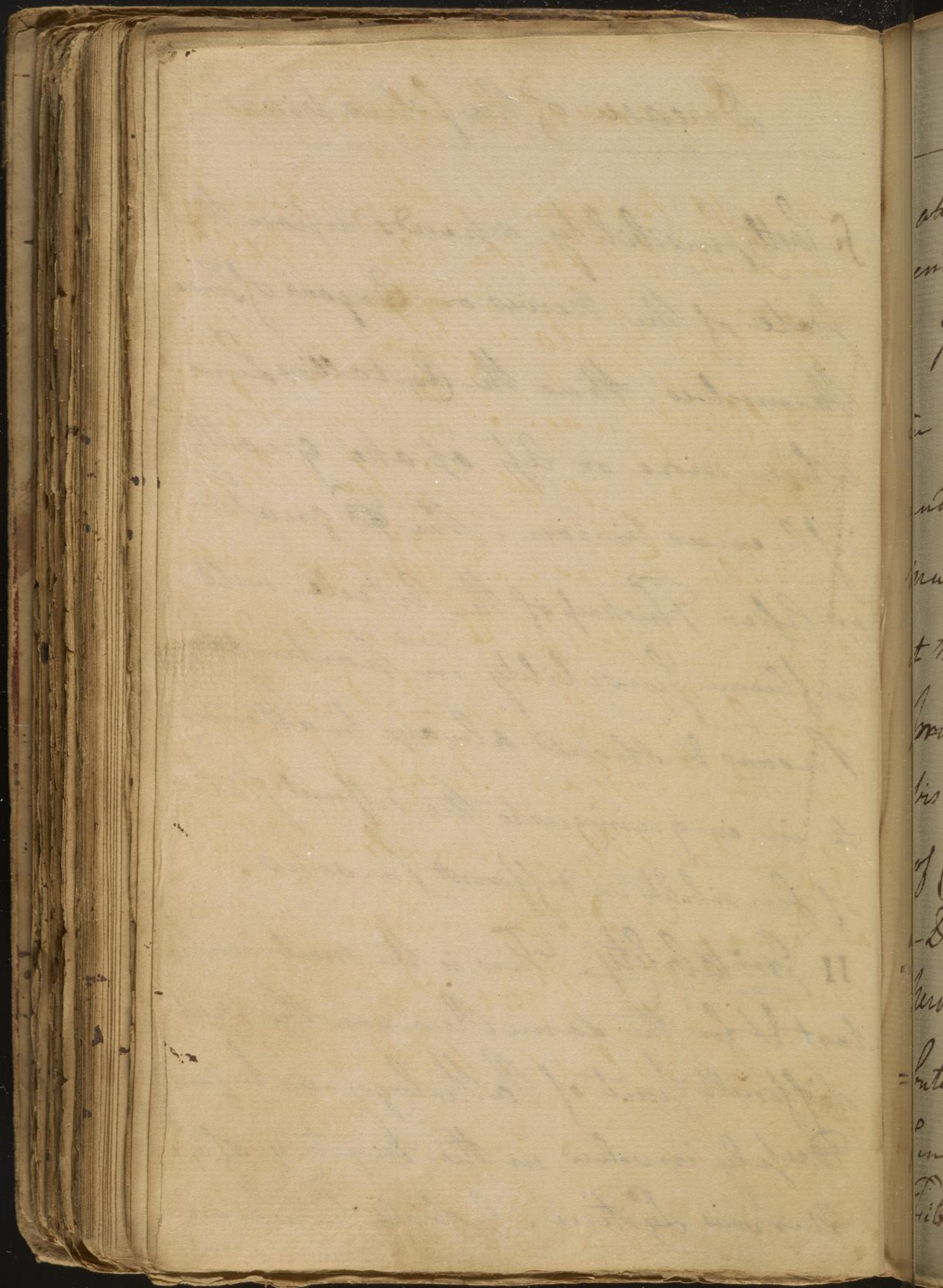
e. Sensibility is greatly influenced by Habit.
- it is then always relative & never
can depend upon the Absolute Force
of Impressions.



Diseases of the *foliva viva* ³²⁹

So, lastly Sensibility depends upon the State of the Nerves or Organs of Sense themselves. Thus the Crystalline Lens when more or less opaque greatly influences vision. The ~~E~~ greater or lesser Thickness of the Cornea will influence Sensibility in particular Persons & should always be attended to in enquiring into the different States of Sensibility in different Persons.

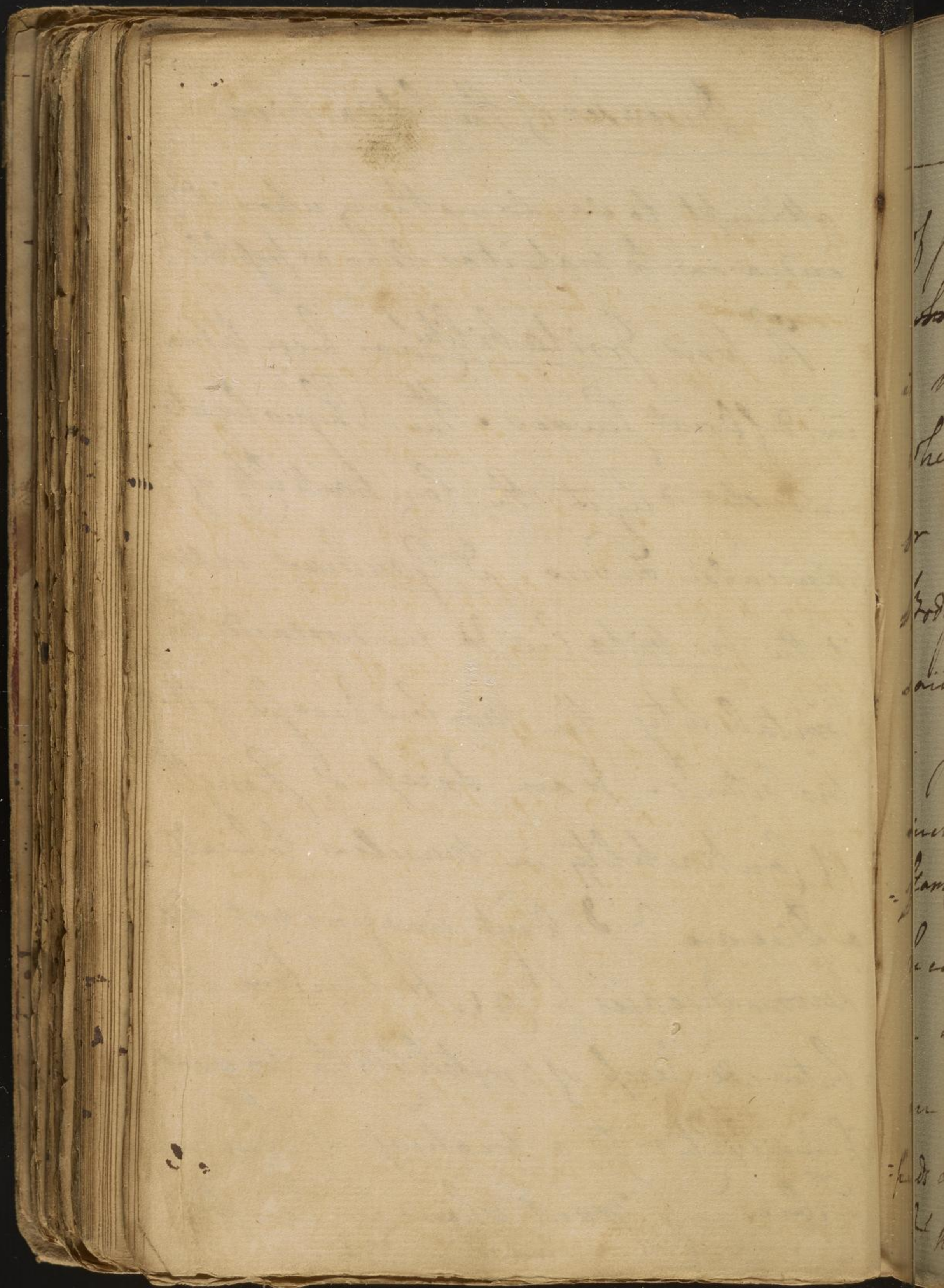
II Irritability. This is the most important & for the same Reason the most difficult part of Pathology, as being deeply involved in the mystery of the Nervous System. I shall however



Diseases of the *solida viva*

attempt to say something upon it, & endeavour to make it as clear as possible.

The word Irritability has been taken in different senses. The Physiologists understand by it the Contractility of Muscular Fibres. Dr. Gaubius calls it the vis vitalis & understands by Irritability the morbid excess of the vis vitalis. Is an excess of strength of Contractility in muscles to be called a Disease? Dr. Whist imagines not. See "Nervous Diseases" p. 91. & therefore attributes all excess of Irritability to too great Sensibility or to a weakness of moving Fibres. I grant when this excess



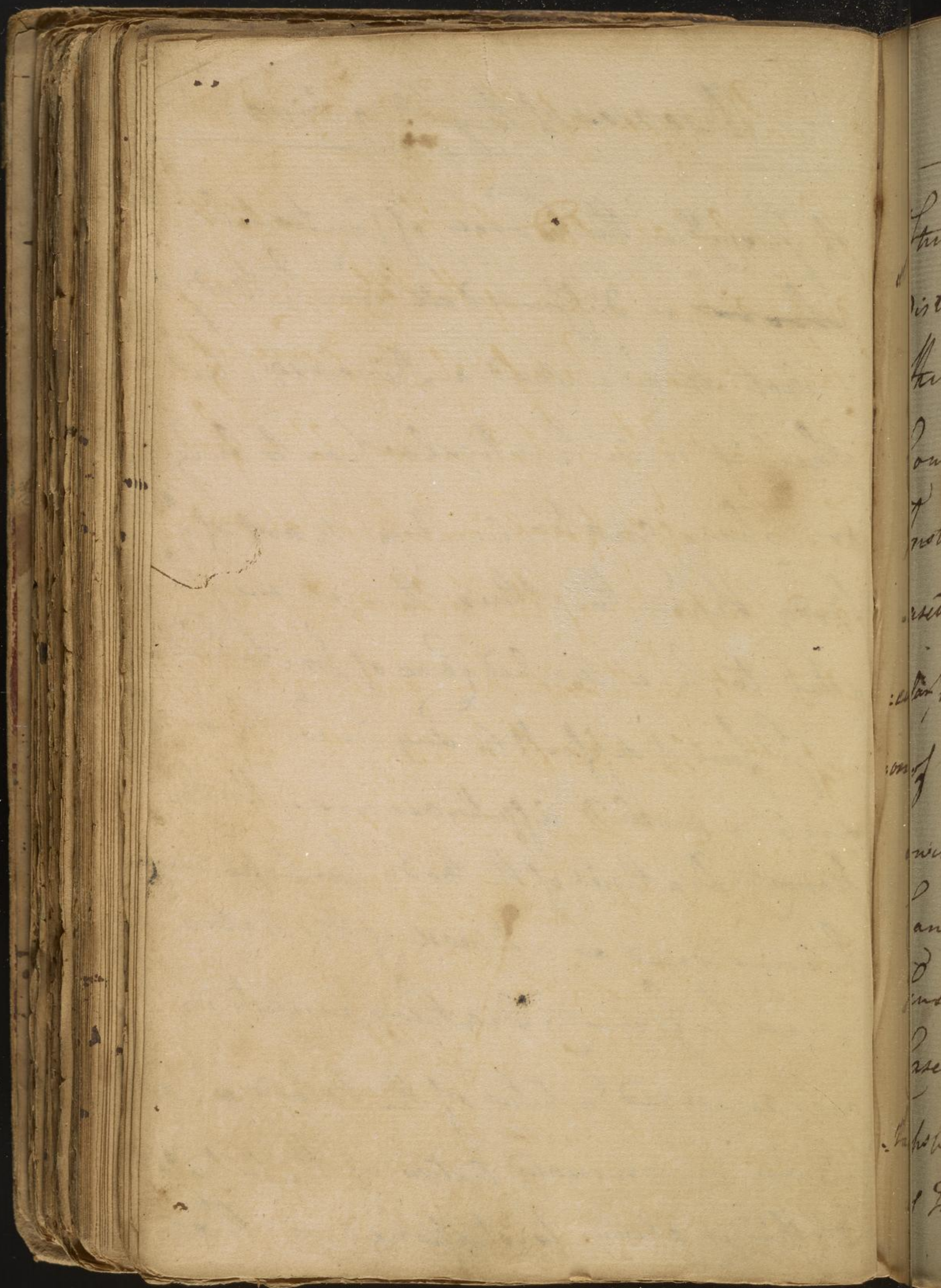
331

Diseases of the Solida Viva

of strength in the Force of Contractility
~~where it~~ is diffused all over the Body it
is not to be called a Disease, but
when it is in particular parts only
or when greater in one part of
Body than the Other then it may be
said to be a morbid case of Irritability.

I find it difficult to say in w. cases
such a morbid affection occurs. The In-
flammatory Diathesis of the body perhaps may
be considered as a Disease of this Nature.

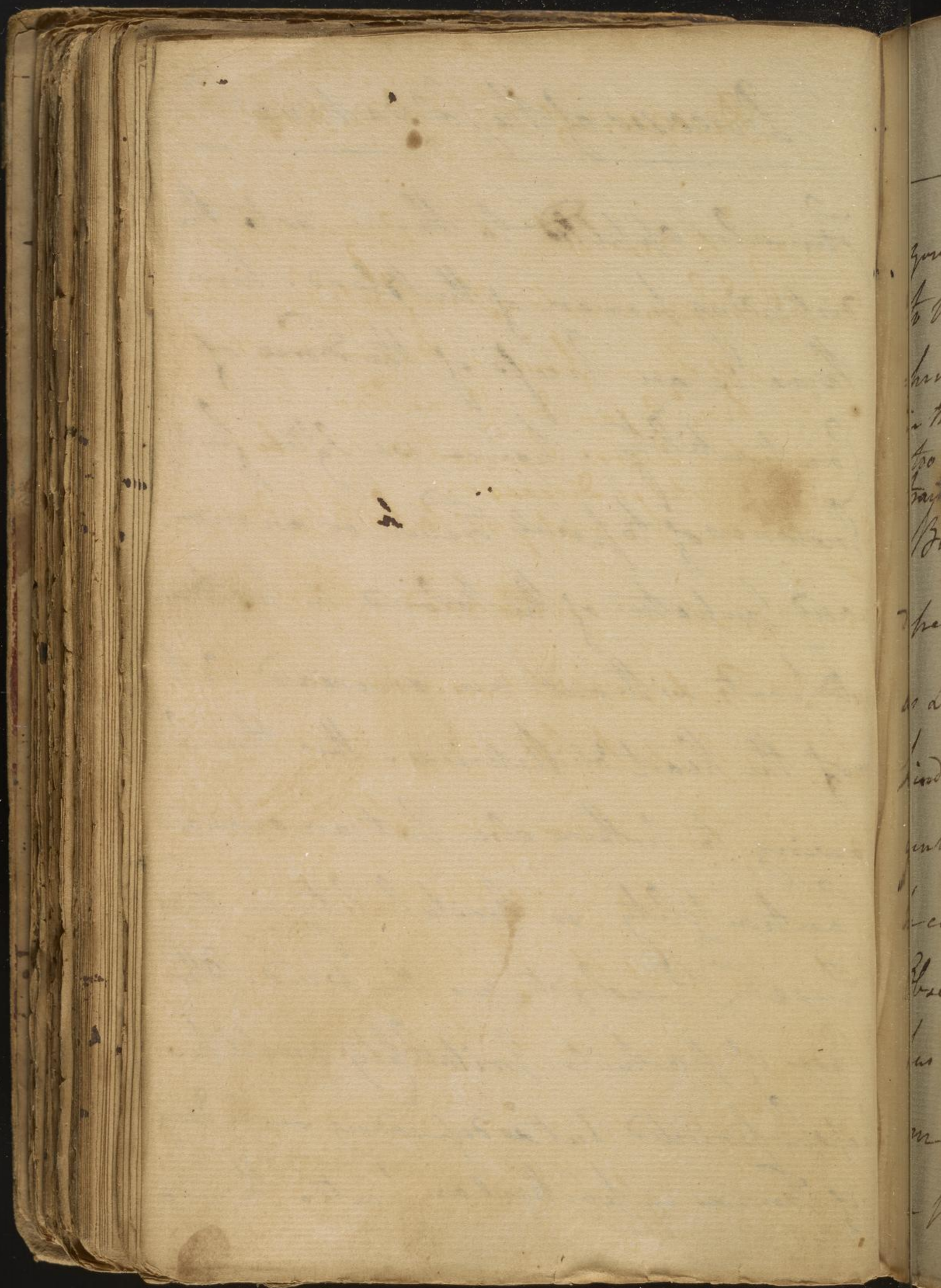
— an Inflammatory Diathesis consists in
an increased Impetus of the blood w. de-
pends on an increased action of the vessels
It is always proportioned to the



332

Diseases of the Solida tria

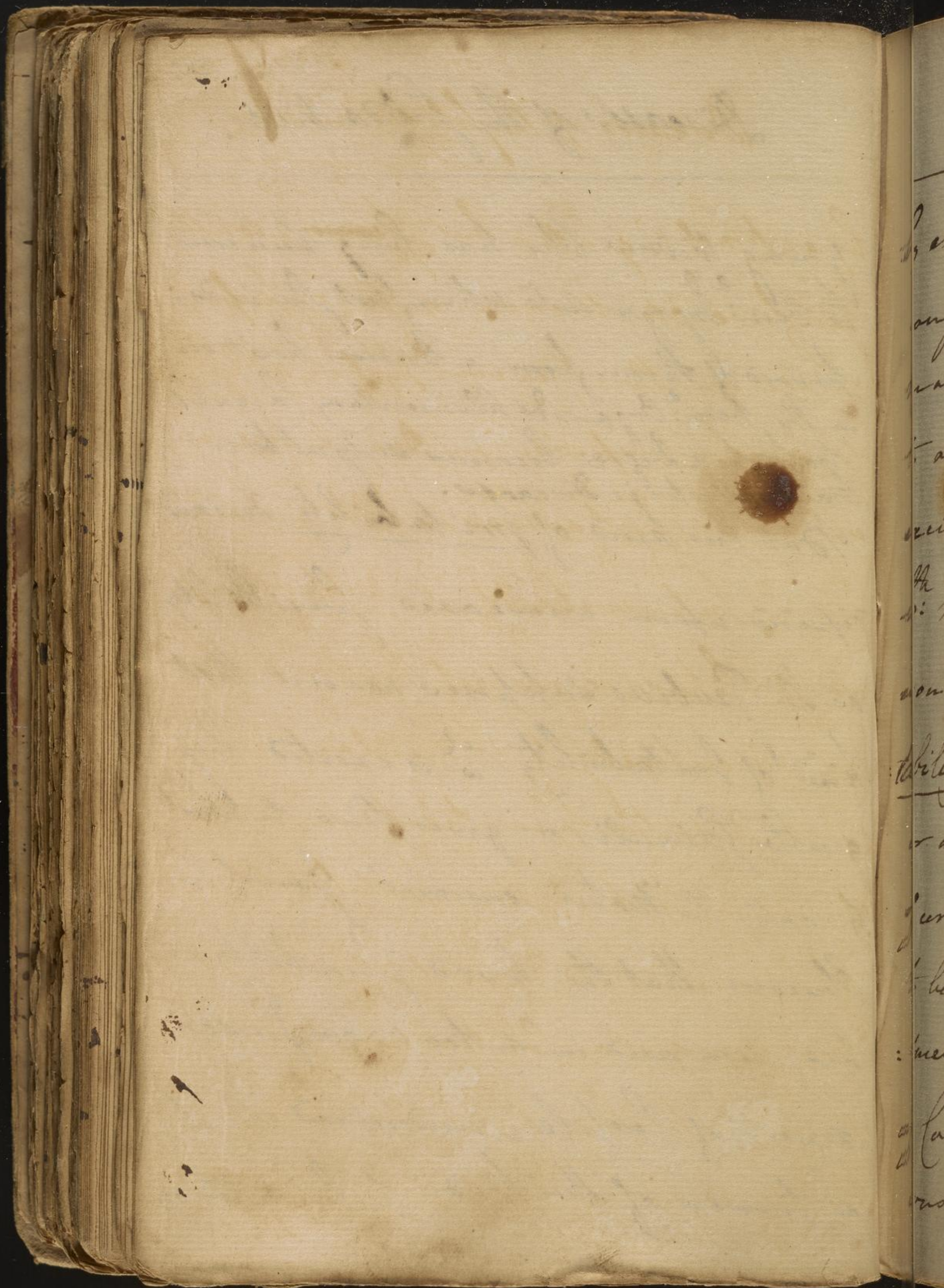
Stimulus applied to them, or to the
distending power of the blood. here
there is an increase of the force of
Contractility. hence we often find
Instances of topical Fever or an encreased
Impetus of the blood in particular
parts without an encreased Action
of the Heart & Arteries. this then being
owing to nothing else but an encreased
Contractility or Irritability in that
Place in ^{the} Physiologists use the word. Other
Cases of particular Irritability might per-
haps be pointed out as depending on an excess
of Tension in particular parts. Thus a



Diseases of the *folida viva*.

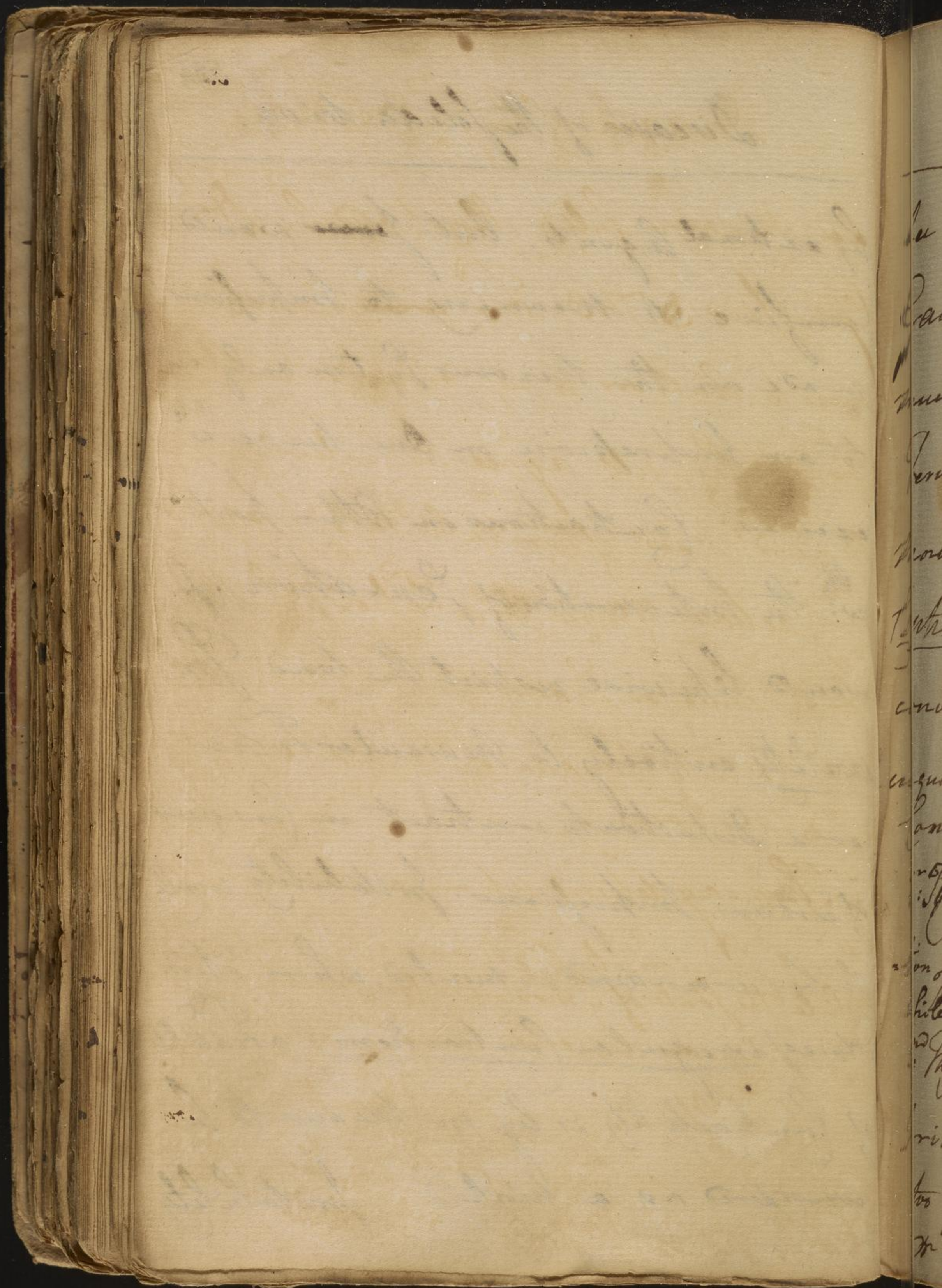
young widow who has long been used
to ven^e enjoyments when first she is de-
prived of them, from a tension bro^t on
in the ven^e Organs & Alimentary Canal to
too high a degree becomes subject to a
train of Hysterical Diseases.

But this kind of irritability does not
depend upon increased sensibility
as Dr. Gaubius supposes, nor is it that
kind of Irritability w^h is excited by
gentle stimuli, or gives Rise to what
he calls the "Motus enormis" I must here
observe that the word Sensibility
has been used in a too vague sense.
most of People understand by it
a power of the Body to be acted on



Diseases of the Solida Viva.

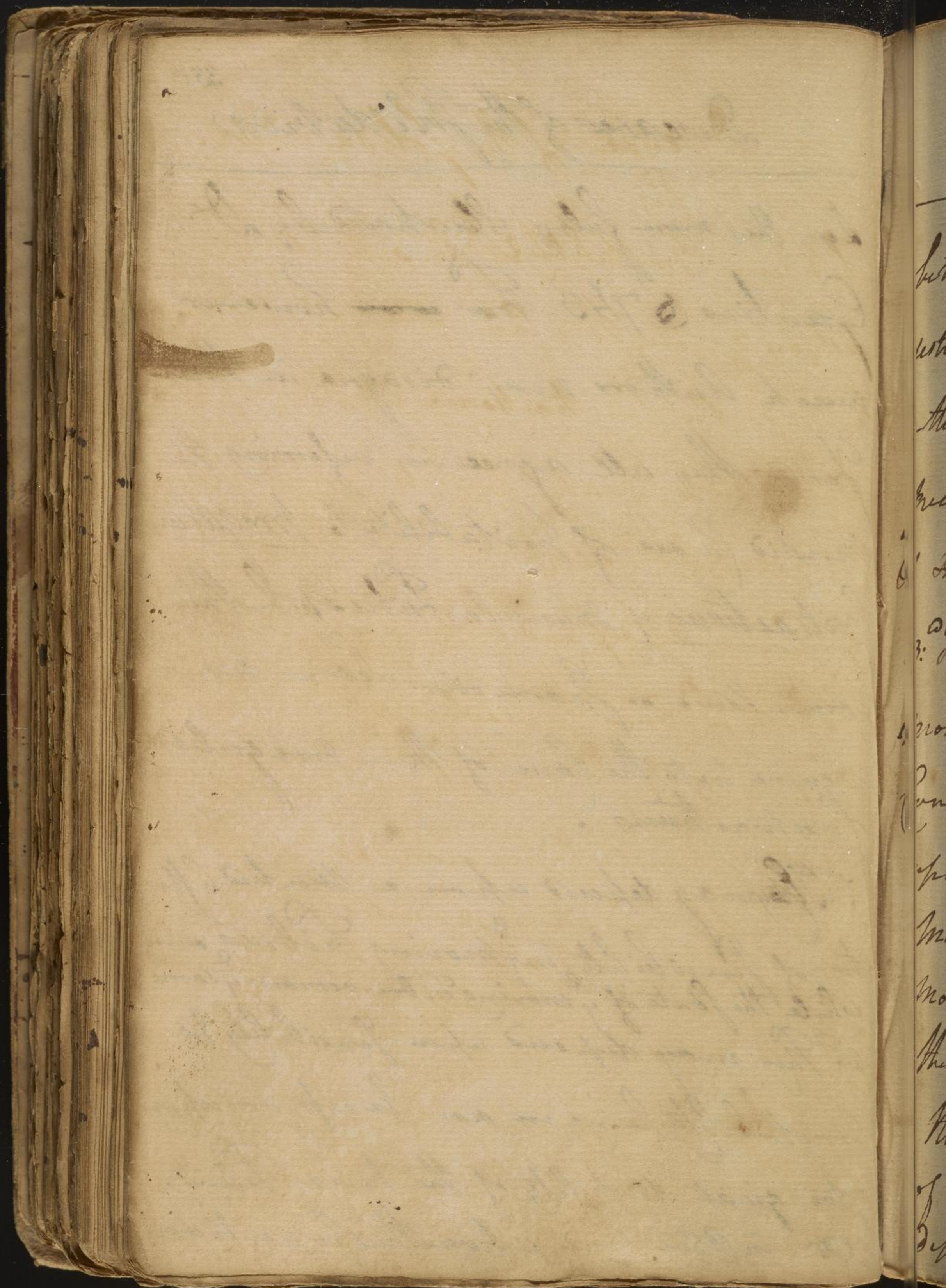
by external Agents. but ~~James~~ would
 confine its meaning to Impressions
 made on the Nervous System only or
 to an Impression on One nerve w.
 excites Contractions on Other parts
 w: the Intervention of Sensation. I
 would likewise restrict the word Irri-
tability entirely to Muscular Fibres
 or a Disposition to contract in consequence
 of certain Impressions. Irritability is only
 to be considered as morbid, when it in-
 duces irregular Contractions. a readiness
 of Contractility is by no means to be
 considered as a morbid Irritability.



Diseases of the Solida Viva

See this more fully illustrated by Dr. Gaubius § 743. For ~~was~~ however much Authors may disagree in their Terms, they all agree in referring the Morbid Cases of Irritability to Irregular Contractions of muscular Fibres whether convulsive or Spasmodic. Let us now enquire into the Cause of these Irregular Contractions.

- 1st They may depend upon a Morbid Affection of sensibility in ^emoving Fibres even while the state of ^emoving Fibres remain ^esame.
- 2nd They may depend upon Sensibility & Irritability being in an Excess or upon too great mobility of the nervous Fluid, Or in other words upon the Proportion



Diseases of the Solida Viva.

between Irritability & Sensibility being destroyed. in this case a weakness generally attends the Contractions. hence they are peculiar to weak Habits - young Persons & Hysterical women.

3.^d They may depend upon the state of y.^e moving Fibres themselves, without any Connection w.th Sensibility. They depend upon a want of Tension, or upon too movable Tension. Most of the irregular Motions we perceive in the System arise from these Causes. let us 1st enquire into the Diseases arising from a want of Tension. the most simple Affection depending on this Cause is premota Tension.

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Disease of the solida tria

Often depends on ^a weight apprehended.
now if this is removed a Tremor nat-
urally ensues. it would be easy to men-
tion a hundred examples of Tremors arising
from this Cause. Tension likewise depends
on a Fulness of the Blood: vessels in
particular Limbs. hence a Tremor to
of the Hand often follows Venese-
ction. Universal Tremors also are often
the consequence of general Hemor-
rhages. Depletion may act too by
taking off Tension from the Brain &
thus diminishing the tonic power.
the Passion of Fear acts in $\frac{1}{2}$ same

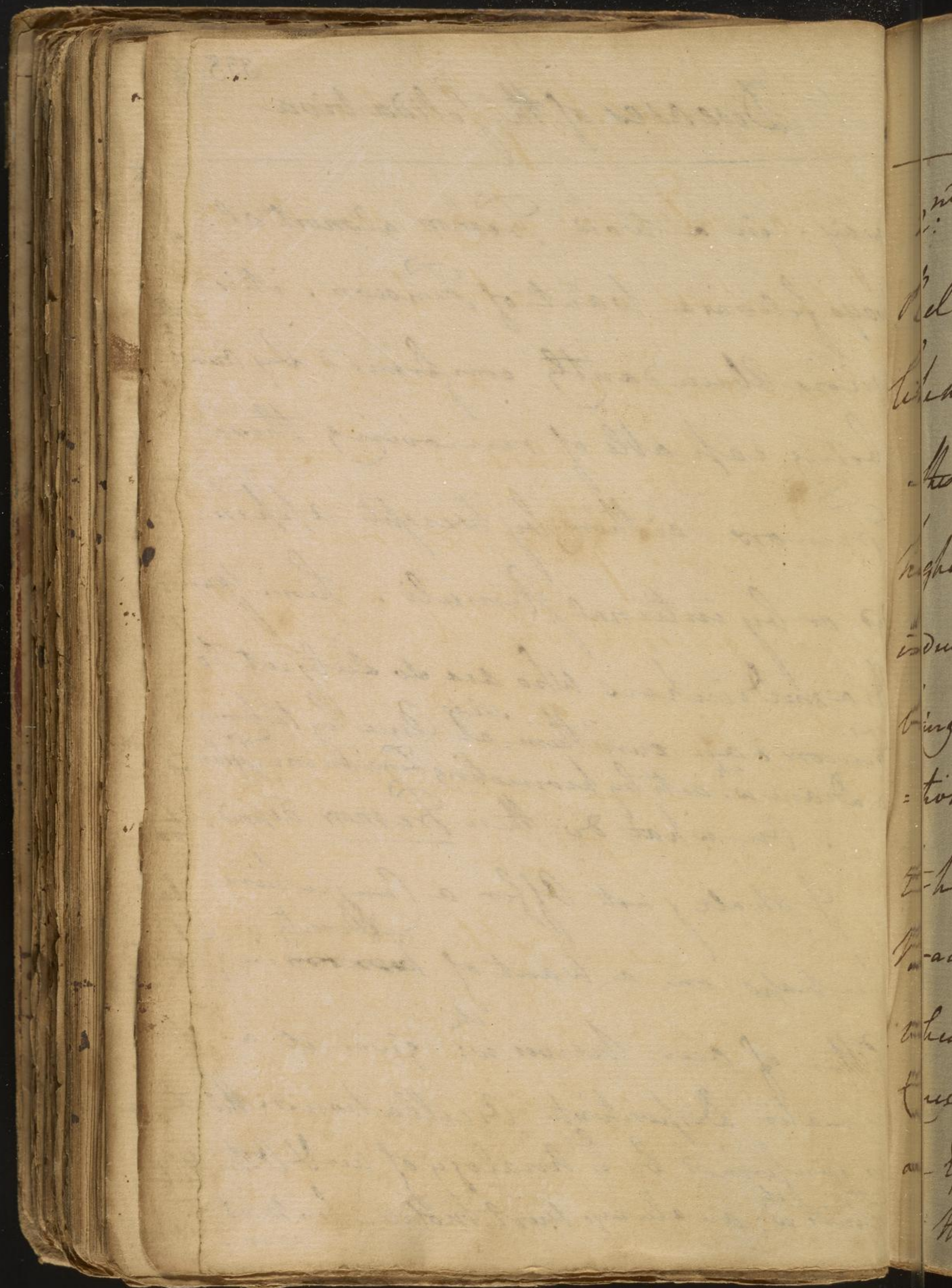
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Diseases of the Solida Viva.

way. in a word Tremor almost al-
ways follows a want of Tension. it is
more abundantly confirmed by our
being capable of removing these
Tumors either by weights applic-
ed or by internal stimuli. Some Gour-
mandisers who are so subject to
Tumors can cure them ^{themselves} at once by taking
a Dram w: acts by promoting Tension in ^{the} system.
On what do these Tremors depend?

I shall just offer a Conjecture.
perhaps on a want of ^{Density} ~~in~~ in
Other of our Nerves w: gives it a
greater Disposition to Oscillations. this
is confirmed by ^{the} analogy of Air & Other
Fluids w: are always least mobile when most
dense.

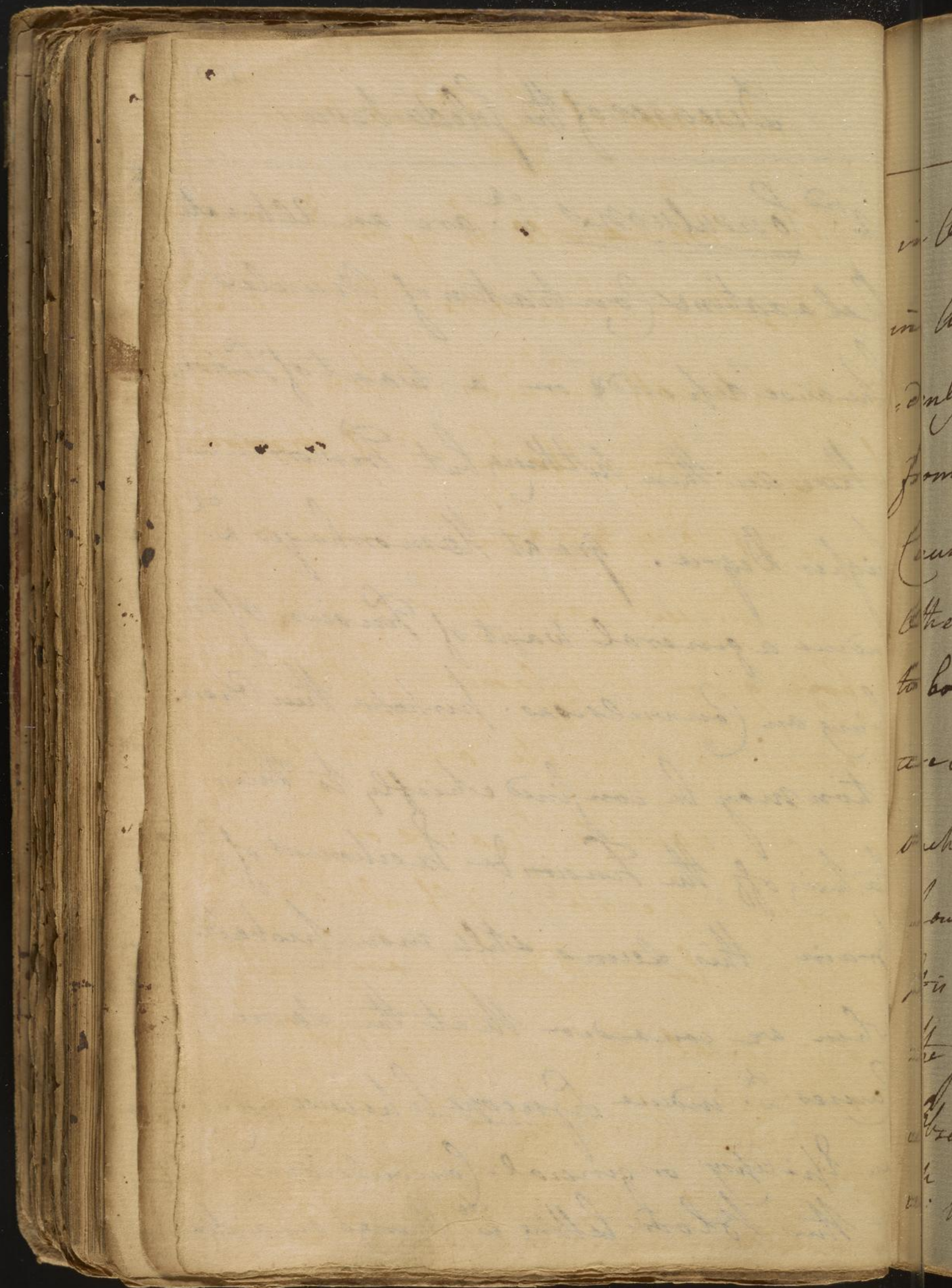


Diseases of the Solida tria.

339

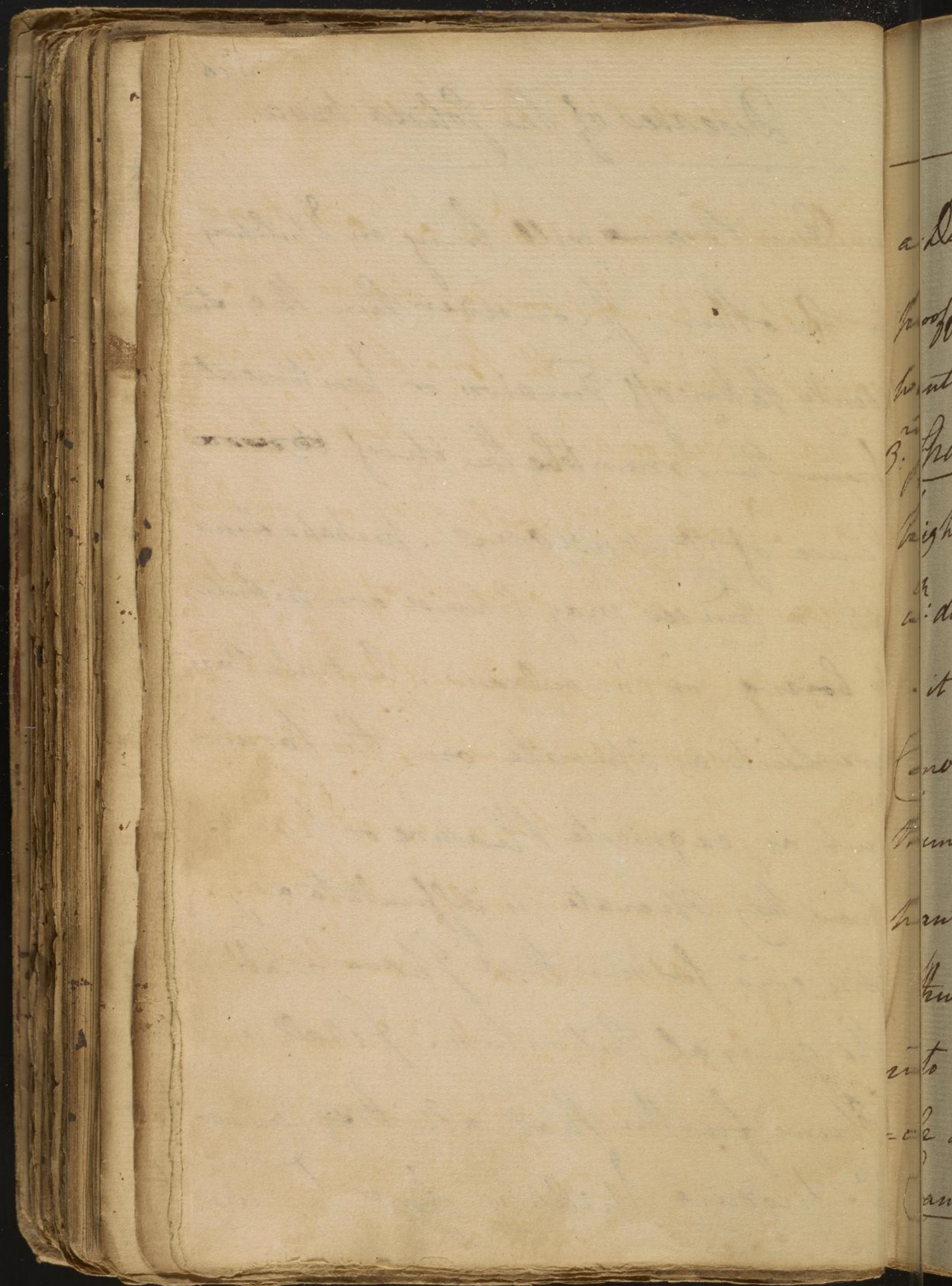
2nd Convulsions ^{ch} w: are an Alternate
Relaxation & Contraction of Muscles
likewise depend on a want of Tension.

These are then nothing but Tremors in a
higher Degree. Great Hemorrhages ^{ch} w:
induce a general want of Tension often
bring on Convulsions. perhaps their Opera-
tion may be confined chiefly to their
taking off the Tension & Excitement of ^e
Brain. This seems still more probable
when we consider that the same
Causes ^{ch} w: induce Syncope likewise bring
on Epilepsy or general Convulsions.
- Thus Blood: letting ^{ch} w: brings on Fainting



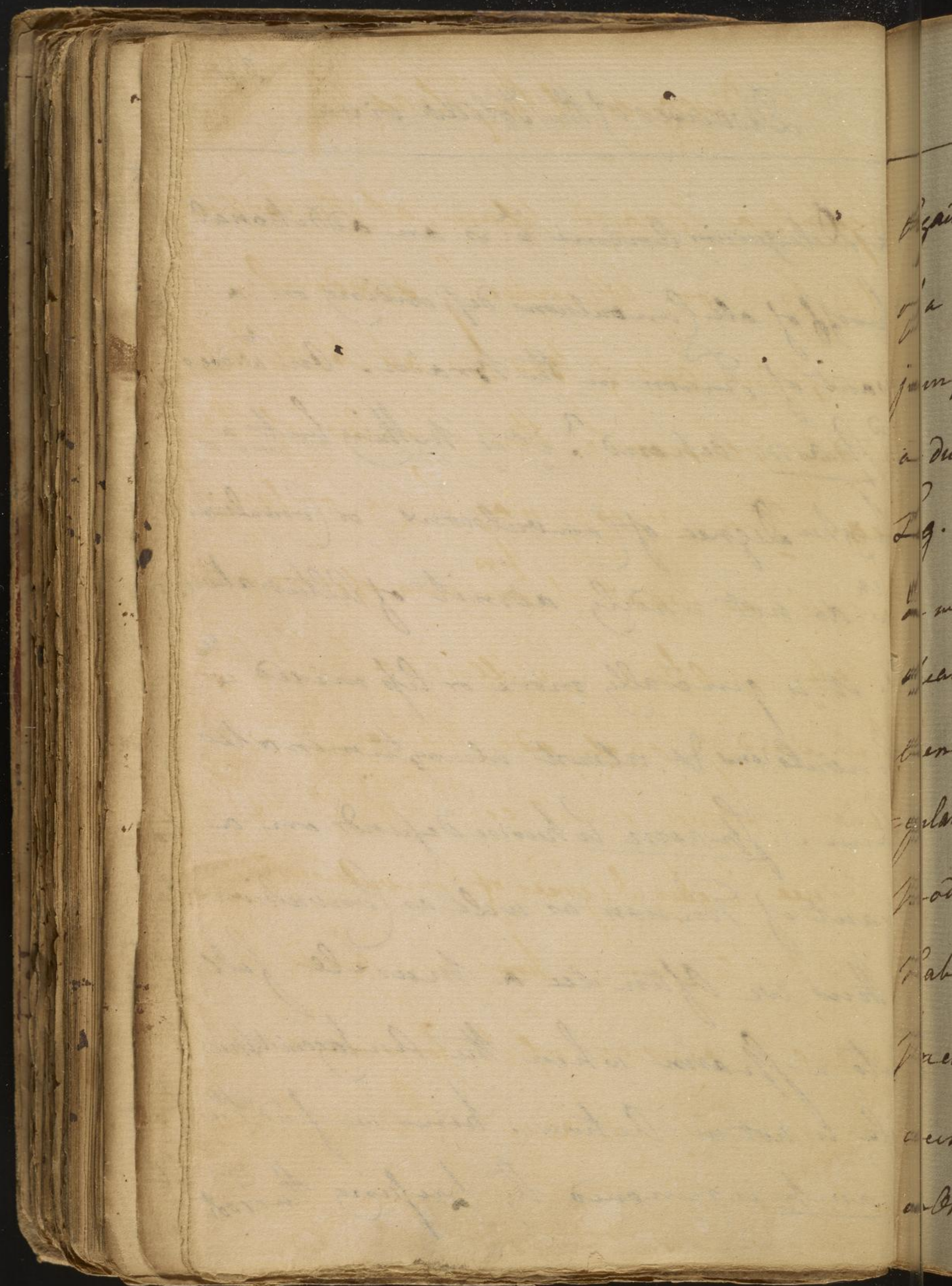
Diseases of the folida viva

in One Person will bring on Epilepsy
in Another. I consider then the sud-
denly taking off Tension or Excitement
from the Brain to be the chief ~~cause~~
Cause of Convulsions. perhaps some
Other Causes may likewise contribute
to bring on Convulsions, but all these
are such as Operate on the Brain
such as exquisite Pleasure or pain.
how they Operate is difficult to say.
It is enough for me that I have established
the general Proposition. I shall only
Observe further that all the Causes
w^h produce Epilepsy first produce



Diseases of the Solida viva.

a Deliquium Animæ ^{ch} is an additional
 proof of all Convulsions depending on a
 want of Fusion in the Brain. An ^t ^{ch} does
 3rd Spasm depend? it is nothing but a
 higher Degree of Convulsions. or Convulsions
^{ch} ^{ch} do not readily admit of alternation.
 it is generally more or less mixed ^{ch} ^{ch}
 Convulsions & almost always terminates
 them. Spasm likewise depends on a
 want of Fusion as well as Convulsions.
 Thus we often see a muscle fall
 into a spasm when the Antagonist Mus-
 cle is not in Action. hence we find the
Crampe is removed by pressing the foot



342

Diseases of the Solidabivæ.

Against a Board placed at the bottom
of a Bed, or otherwise suddenly
jumping out of Bed, so as to restore
a due Tension to the Muscles of the
Leg. Other Causes may bring on spasm
as well as want of Tension of ^{the} we shall
speak here after. To illustrate ^{it} we have
been said, I shall add that every Irre-
gular Motion must increase itself &
produce higher Degrees of Convulsions: By
Habit all our Actions are fixed to a
precise Manner of Performance - to
a certain Velocity & a regular Succession
in Order. Thus every Man has his

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343

Diseases of the Solida viva

manner of speaking, but if any thing
interrupts this manner, how easily
is he thrown into Confusion by the violence
of the system being destroyed! This will
teach us how stimuli produce convulsions.

They act by bringing on an increased
Influx of the nervous Fluid & thus increase
irregular motions w: by time and
habit become natural to the system.

Stimuli then act by hurrying the ner-
vous power & thus bring on irregular Moti-
ons w: in all weak Habits must necessa-
rily increase themselves. What has
been said applies to all Cases of
Convulsions depending on Inanition

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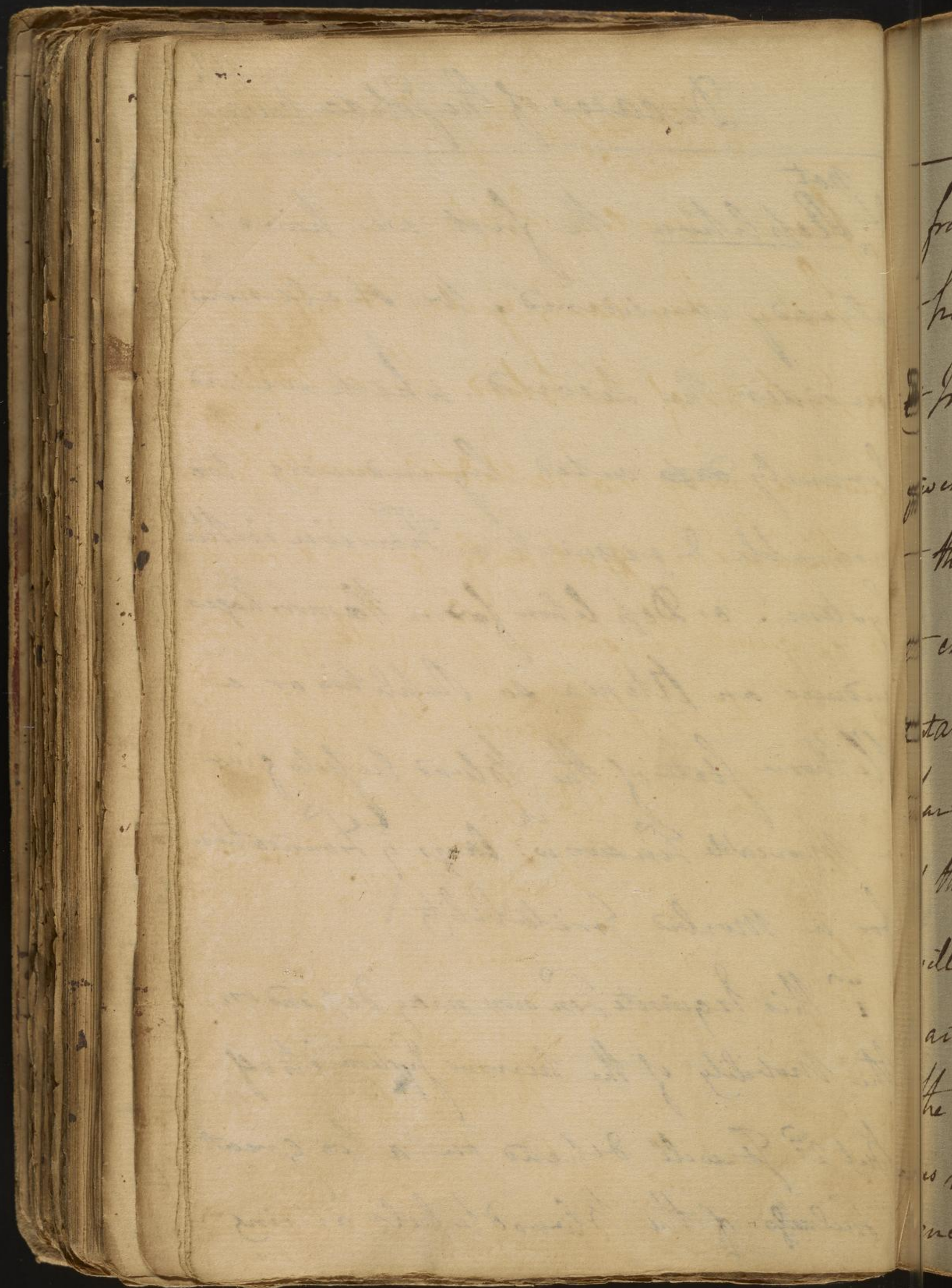
344

Diseases of the Solida viva.

^{not} & Repletion. The first we have
already considered. We shall now
consider the Second. which we said
formerly ~~was~~ cured by inducing too
movable & exquisite a Tension in the
System. as Depletion from Hemorrhages
induces an Atonia so Repletion or a
Plethoric state of the Blood vessels gives
a movable Tension ^{or} lays ^{the} foundation
for a morbid Irritability.

1. This requisite Tension may depend on
the mobility of the nervous system itself

But 2.nd It will depend on a too great
fulness of the Blood vessels arising



Diseases of the Solida Viva

from a morbid laxity in the solids.
 - Hence they easily yield to $\frac{2}{3}$ Quantity
 & Impetus of the blood. This Pulse then
 gives a very variable & moveable Tension.
 - This Laxity not only gives Occasion
 to exquisite Tension in $\frac{2}{3}$ whole System.
 But any thing that gives a laxity to a
 particular part & increases the Impetus
 of the blood in it at $\frac{2}{3}$ same time
 will induce a Tension in a particular
 part of the body. hence we find after
 the Paracentesis a Deliquium Animi en-
 -sues much from the Tension being
 increased in one part & destroyed

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346

Diseases of the Solida viva

in Another. Small Alterations in $\frac{2}{3}$
Balance of the System will always affect
the Body in proportion to its mobility.

- In what Constitutions does such an
exquisite Tension occur? In all Persons
who have lax Solids especially in young
People in whom the Impetus of the Fluids
is greater than in Old People. Infants
who have the most exquisite Tension of
System are upon this Account most subject
to Convulsions. This Predisposition to Con-
vulsions is always increased in Cases of very
sudden Growth when the Solids are sud-
denly stretched, or where the Impetus of

xx these

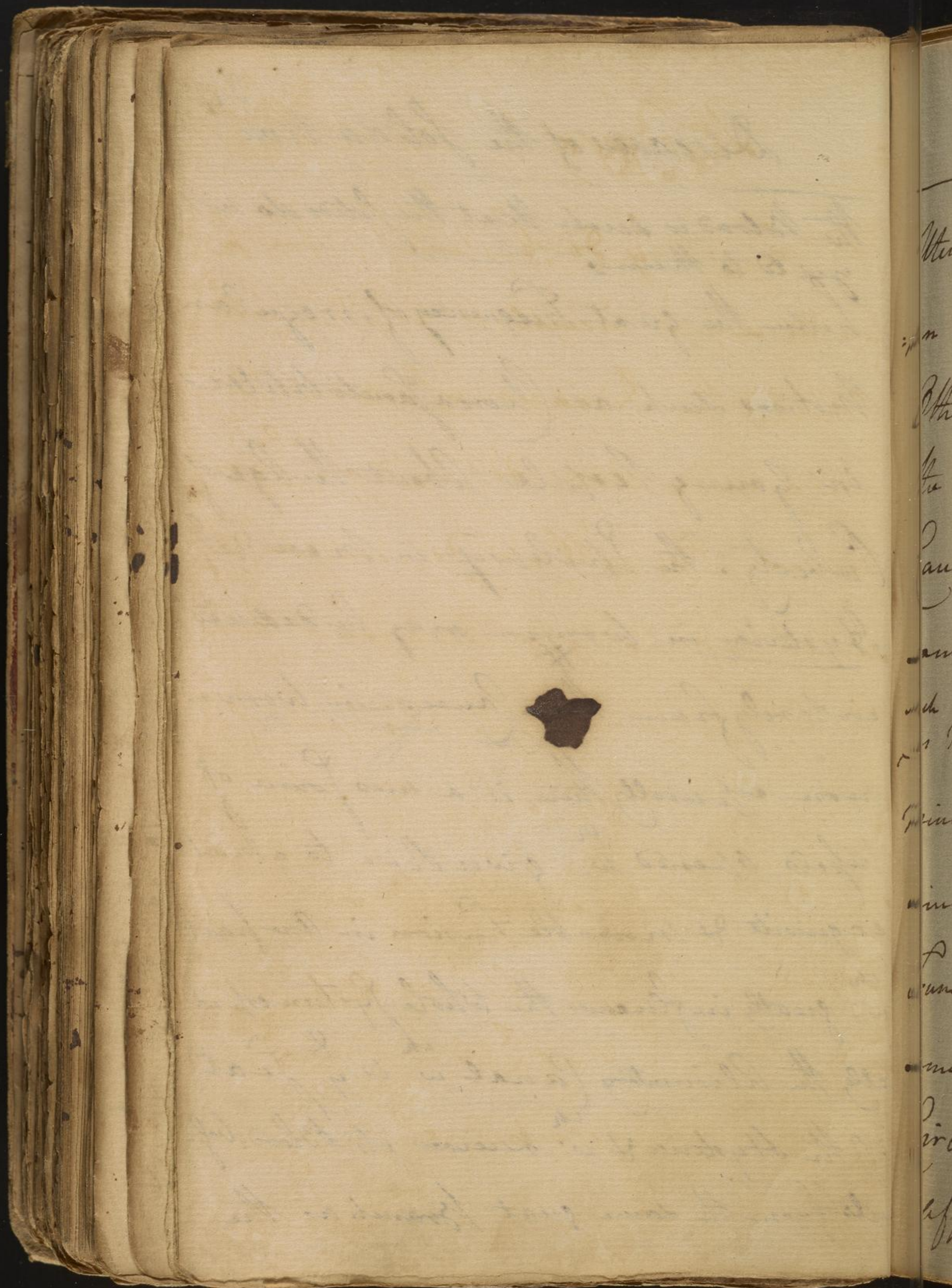


347

Diseases of the Solida biva.

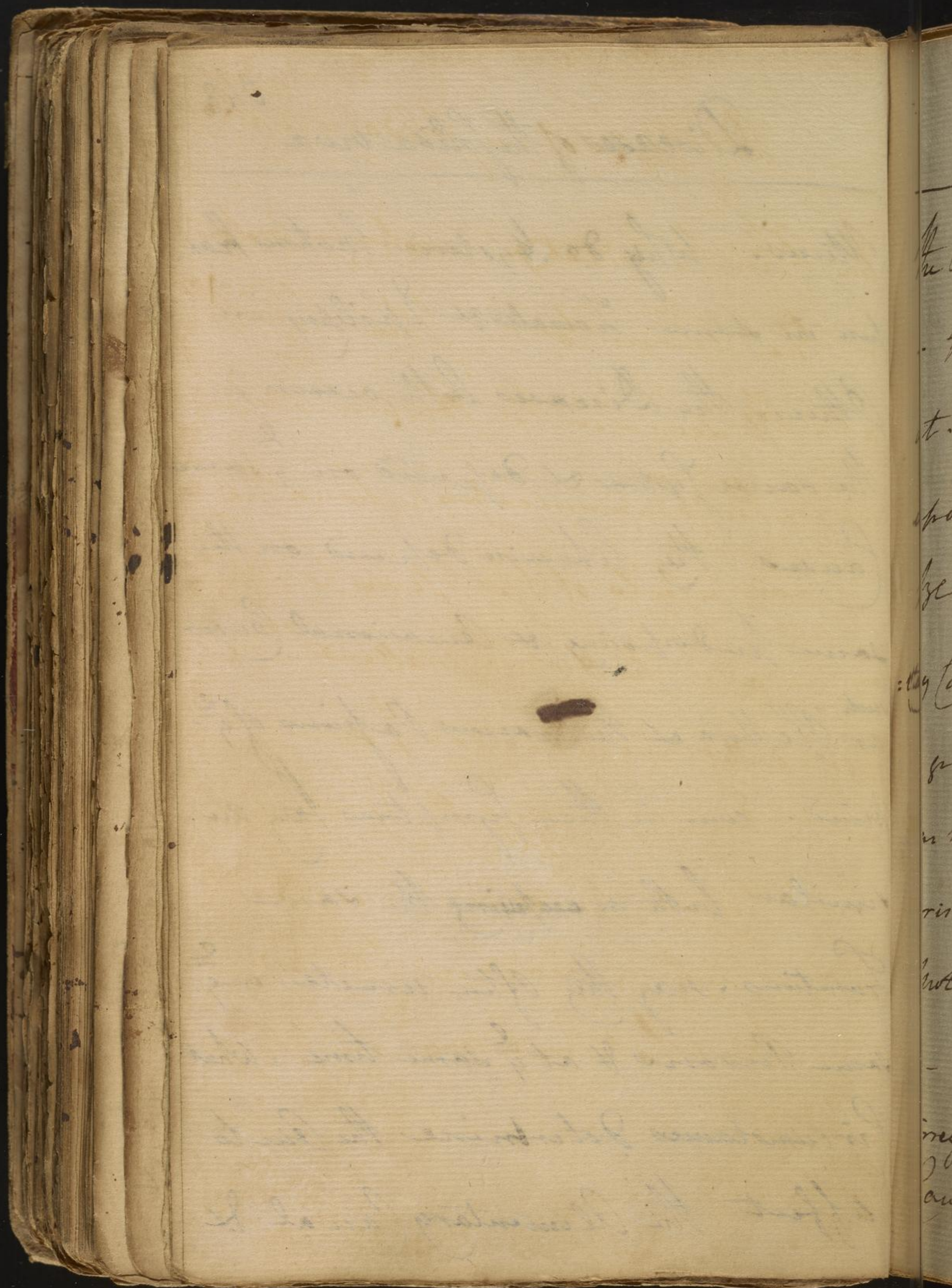
The Blood is such that the Solids do not
yield to them.

Hence the great Frequency of irregular
Motions such as Chorea Sancti Viti &c
in young People about the Age of
Puberty. the Epilepsy in Men & Hysteria
in women may be deduced
entirely from ~~the~~ Causes. in women
more especially there is a new source of
Vessels opened w^{ch} give Rise to a most
exquisite & moveable Passion in one part
w^{ch} greatly influences the whole System especially
the Alimentary Canal w^{ch} is y^e seat
of the Hysteria & w^{ch} receives its Blood: Vessels
from the same great Branch as the



Diseases of the Solida viva

Uterus. Why do Hysterical Motions hap-
 -pen in some Females & Epilepsy in
 Others. the Diseases both occur in
 the same Systems & depend on ^{the} same
 Causes. they likewise depend on the
 same predisposing & Occasional Causes
 such as Plethora & the various Passions of ^{the} Mind. even in their Symptoms they are
 similar both occupying the same
 Functions. nay they often unite in ^{the}
 same Persons & at ^{the} same time. What
 Circumstances determine the One to
 affect the Alimentary Canal &



349

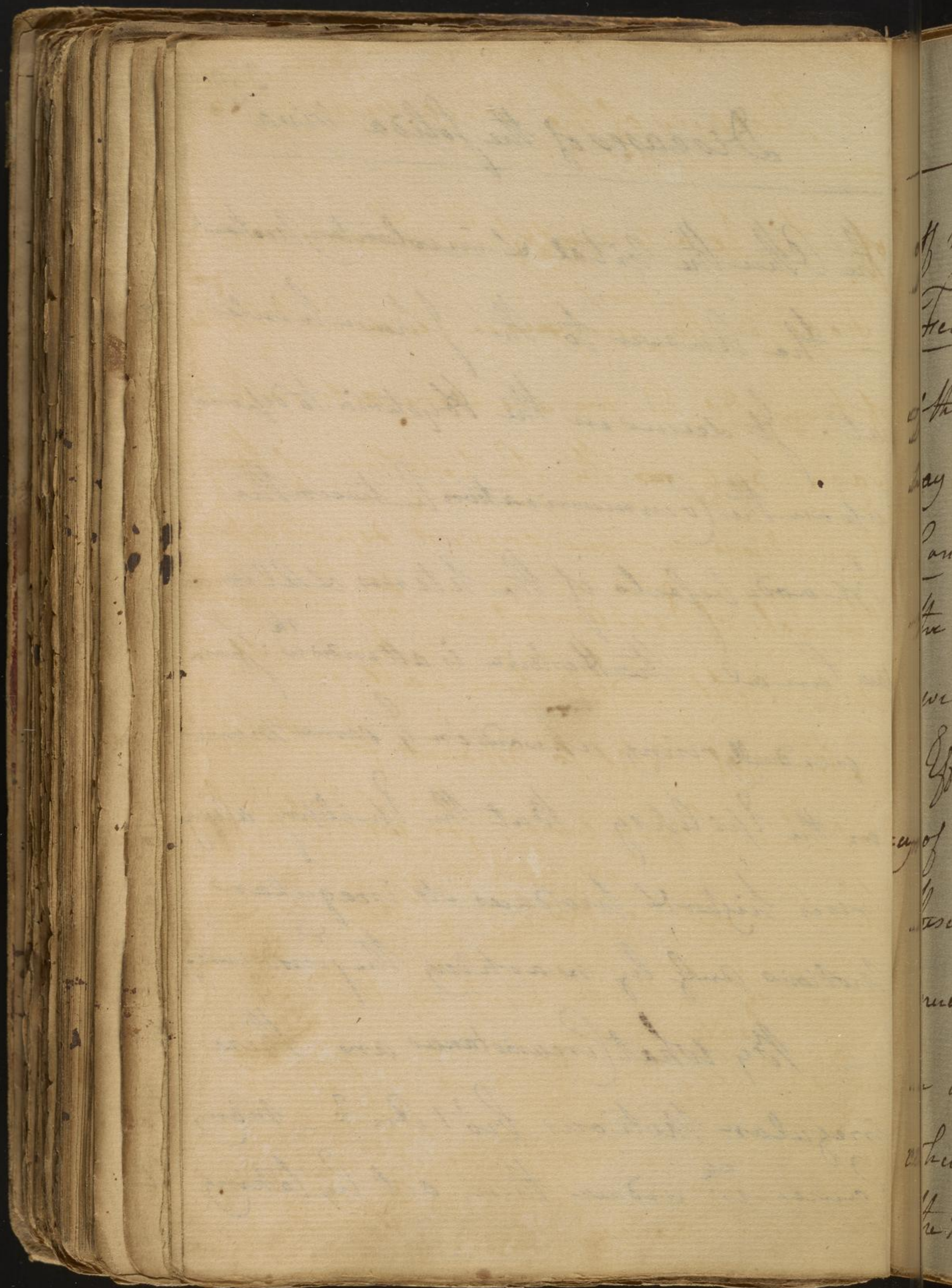
Diseases of the folida viva

The Other the vital & involuntary motions?

- The Answer to this I have hinted at. It seems in the Hysteria to depend upon the Communication between the blood-vessels of the uterus & Alimentary Canal. The Hysteria is attended wth spasms

gradually rising upwards in ^a same manner as the Epilepsy. But the Epilepsy always rises higher & produces its irregular motions only by reaching the sensorium.

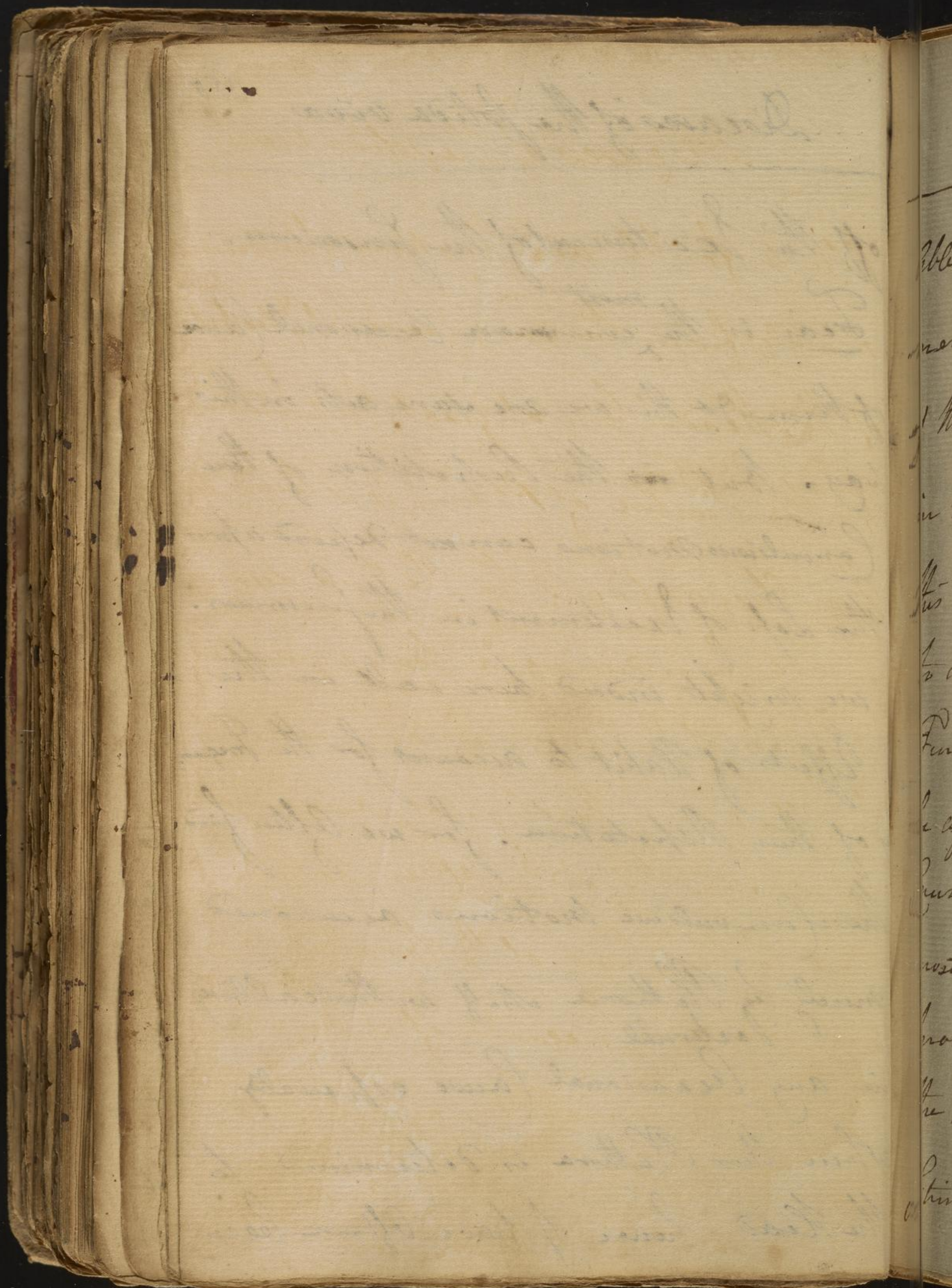
- By what Circumstances are these irregular motions bro't on? - many Cases w^{ch} induce them act by taking



Diseases of the solida viva. 350

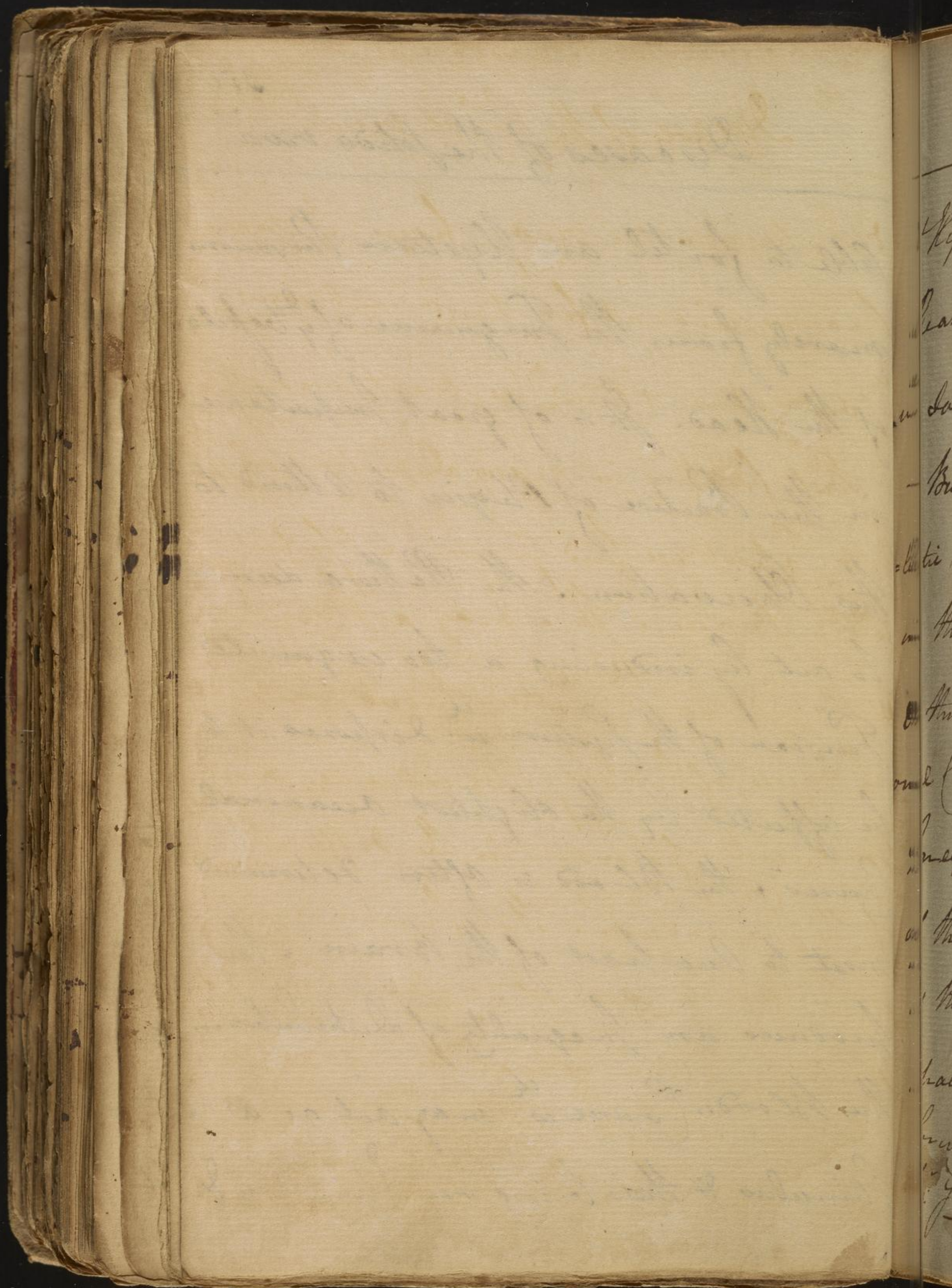
off the Excitement of the Sensorium.

Fear is the ^{most} common occasional Cause of them & this we are sure acts in this way. But ~~is~~ the Repetition of these Convulsive Motions cannot depend upon the Loss of Excitement in the Sensorium. we might indeed here call in the Effects of Habit to account for the Frequency of their Repetition. for we often find these convulsive Motions occasioned merely by Plethora itself without calling in any ^{external} occasional Cause especially when this Plethora is determined to the Head. hence I have often been



Diseases of the folida viva

able to foitel an Hysterie Paroxysm
 merely from the Turgescence of $\frac{1}{2}$ vessels
 of the Head. It is of great Importance
 in the Practise of Physic to attend to
 this Observation. The Plethora seems
 to act by inducing a too exquisite
 Tension of the System ^{or} disposes it to
 be affected by the slightest occasional
 Causes, the Blood is after determined
 most to one part of the brain. This
 produces an Inequality of Distribution in
 the Blood. Course ^{or} may act as a
 Stimulus & thus bring on Epilepsy &

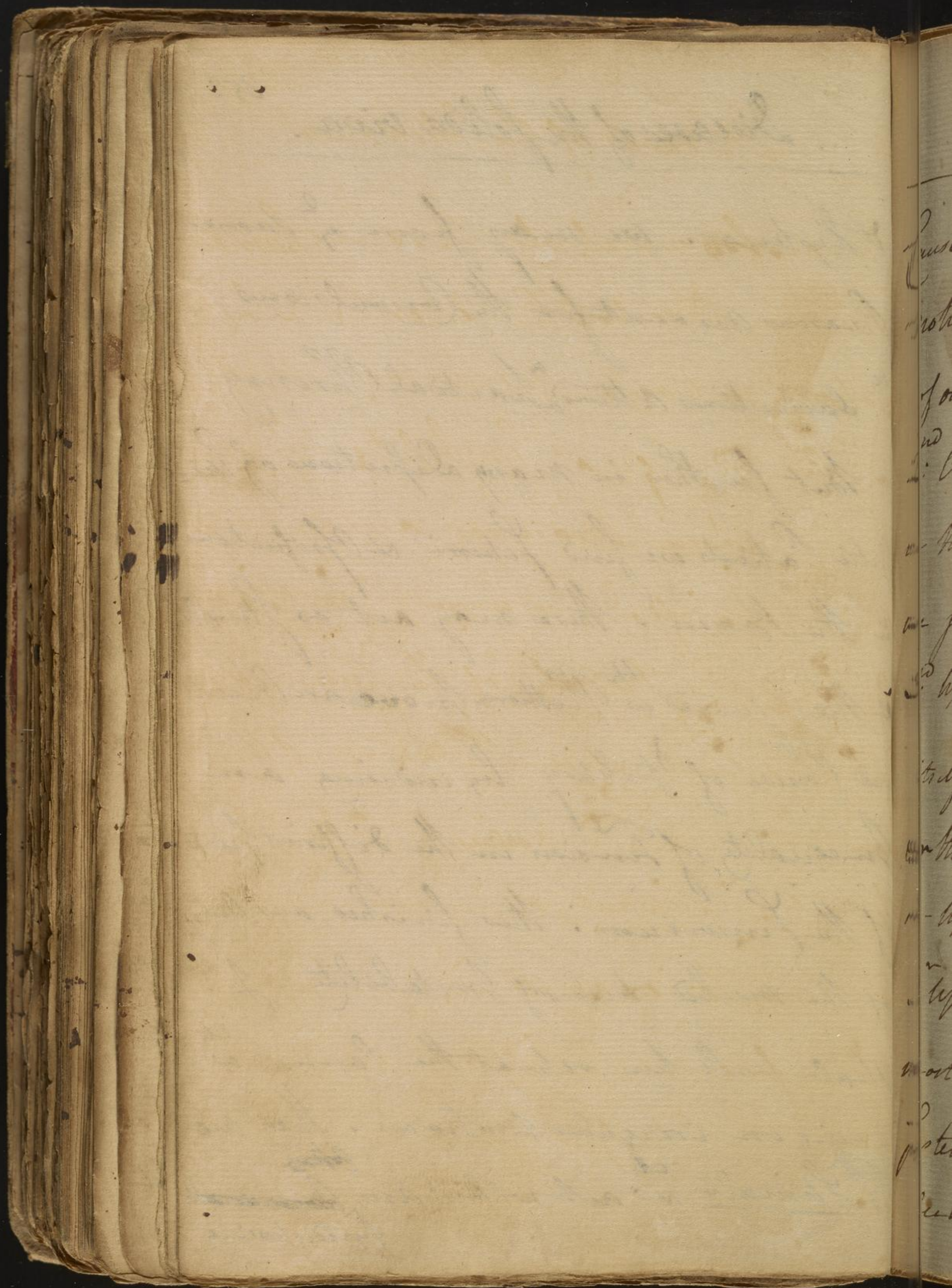


Diseases of the folida viva.

352

& Hysteria. we may from ² same
Reasons account for the Convulsions
th sometimes attend^a partial Phrensy.

- But further in many Dispositions of Epi-
leptic Patients we find Schirri & Ossifications
in the Brain. These may act as Stimuli
& thus joined wth Plethora prove an Occasi-
onal Cause of Epilepsy by inducing an
Inequality of Tension in the different parts
of the Sensorium. This finishes our acc^t
of the morbid Causes of Irritability. I
shall only here repeat the Causes w^{ch}
bring on irregular Motions. They are
th Stimuli w^{ch} act without any ~~Occasional~~
Predisposing



Diseases of the Solida viva

Cause ~~not~~ merely by producing hurried motions, w^{ch} destroys the Order & Velocity of our Actions. But they may depend

2nd On very great sensibility w^{ch} acts in the same manner as the stimuli

w^e spoke of, & is not connected wth increased irritability.

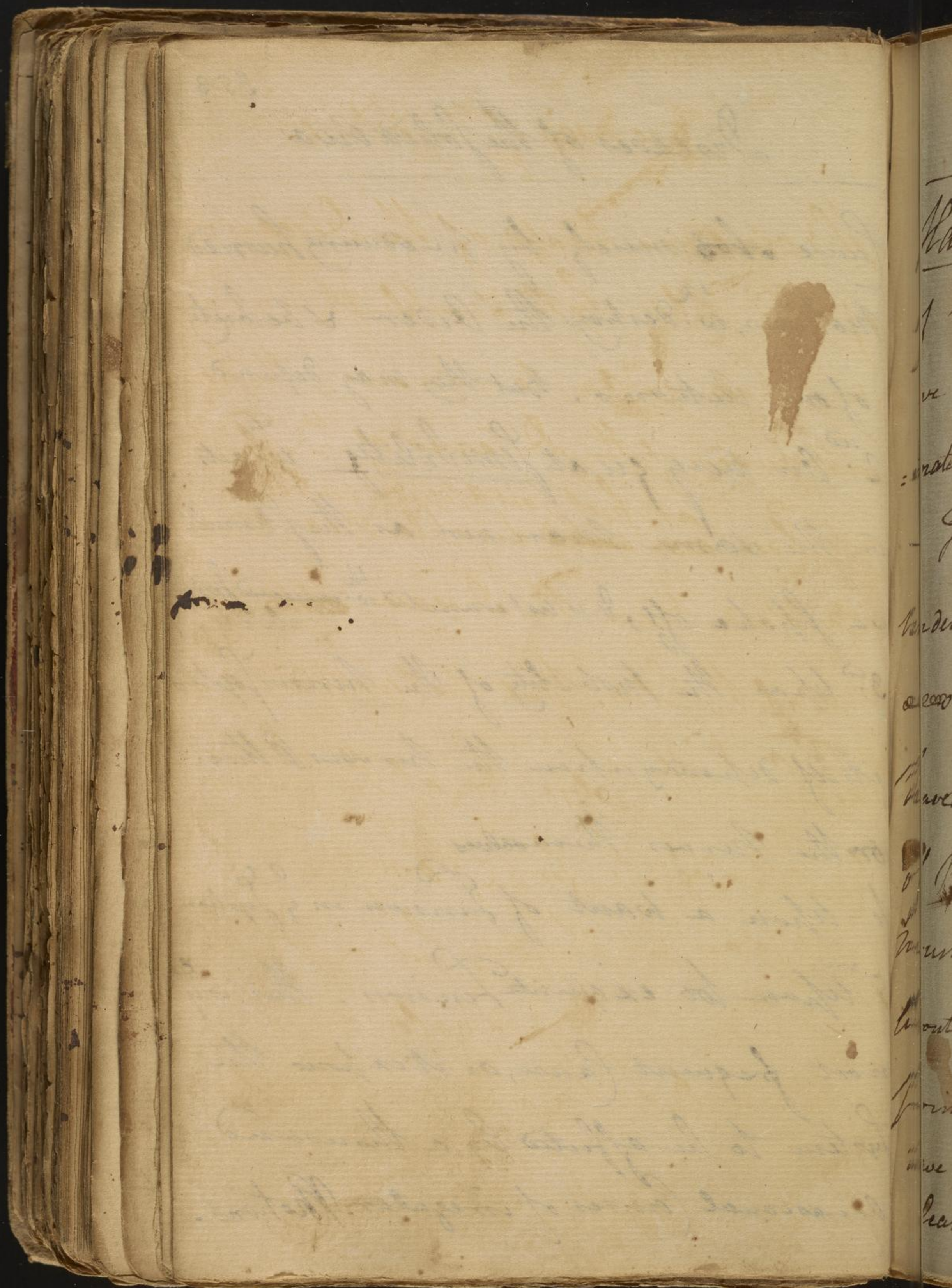
3rd Upon the mobility of the nervous system itself depending upon the nervous & other

or the Nerves themselves

4 - Upon a want of Tension in ^{the} system

5th Upon too exquisite Tension. This is y^e

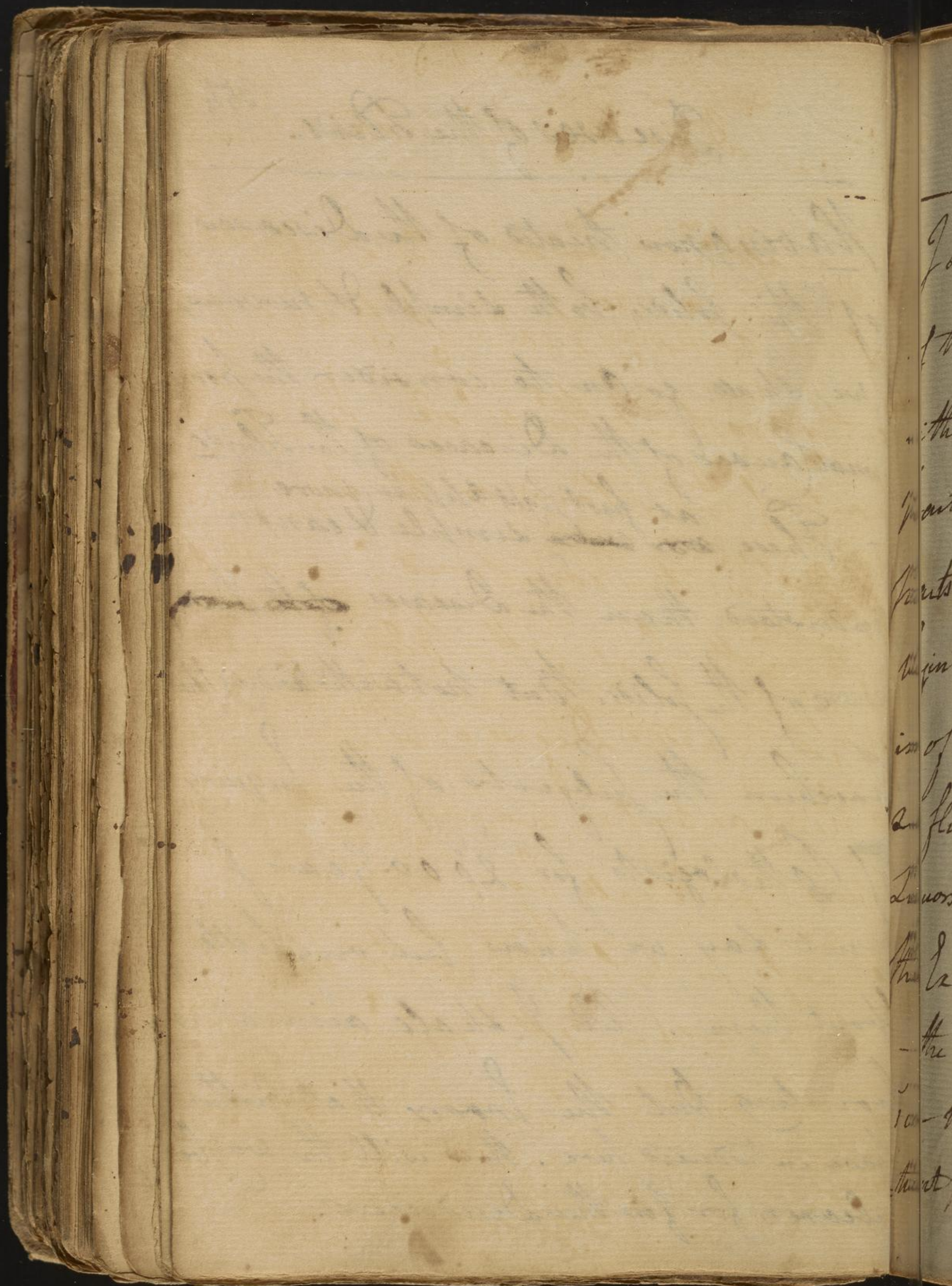
most frequent Cause, as it exposes the System to be affected by a thousand occasional Causes of irregular Motions.



Diseases of the Fluids.

354

Having now treated of the Diseases
of the Solids, both simple & nervous,
we shall go on to consider the prox-
imate Causes of the Diseases of the Fluids.
- These ~~are~~ ^{at first sight appear more} simple & easier
understood than the Diseases ~~of the Solids~~
~~of the Solids~~ of the Solids, But notwithstanding they
have been the subjects of the Inquiry
of Pathologists for 2000 years I
must say we know but very little
about them. All I shall aim at is
pointing out the Errors that Authors
have introduced here. Thus will the way be
clearer for further Discoveries.



Diseases of the Blood

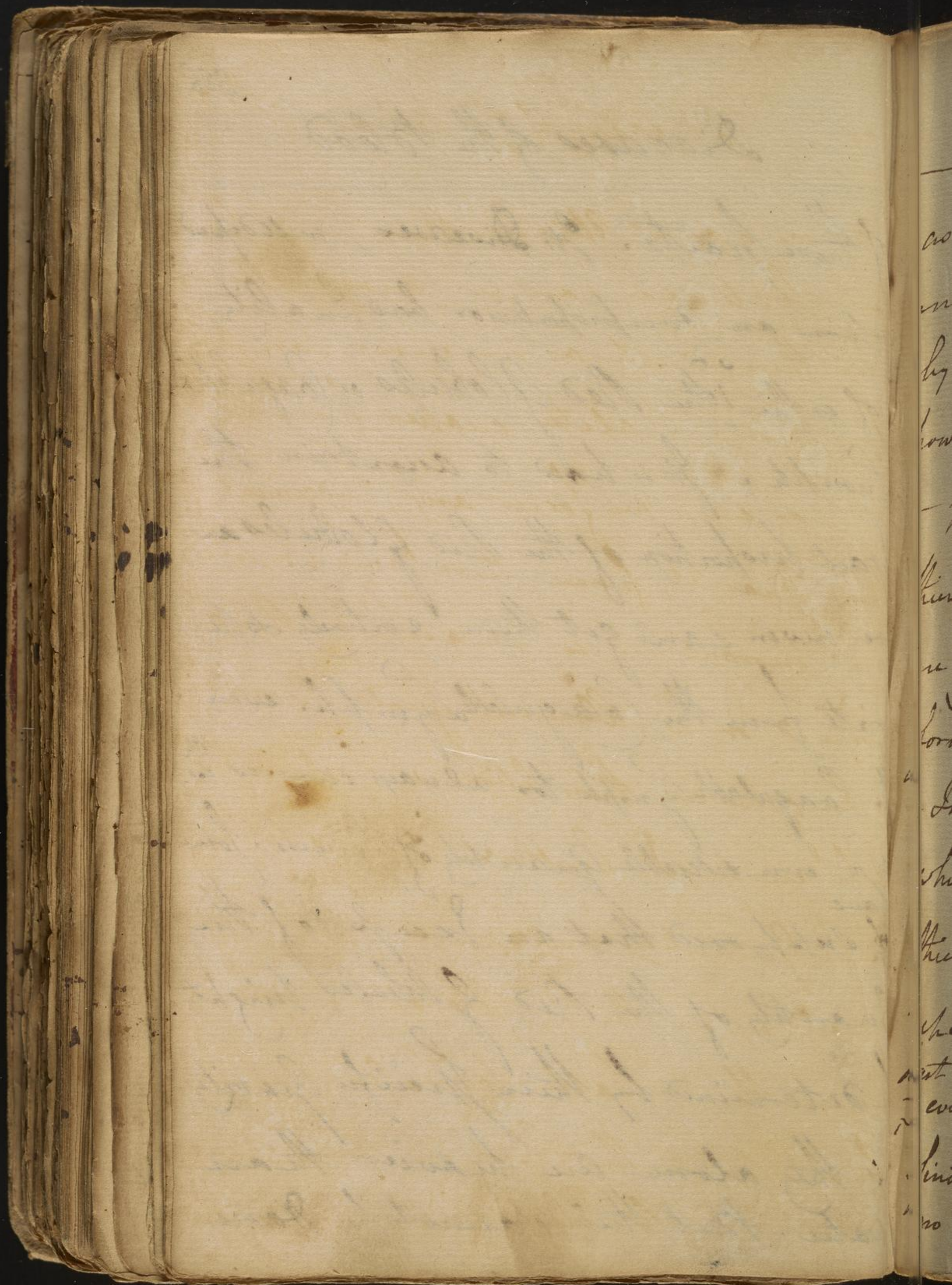
I shall first consider the Diseases of the common Mass of Blood. These either respect the whole Heterogeneous Parts of the Blood or the several Parts of ^{it}: it is composed: we shall begin wth the first. The Blood we know is of a Middle Degree of Fluidity not so fluid as water, nor so viscid as many Liquors. we shall begin with considering the Excess in viscosity or Lentor of the Blood. - the Consistence of the Blood may depend upon the different proportions of its constituent parts, & 2nd upon the Quality

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Diseases of the Blood

of these parts. Its Diseases will depend upon an Over-proportion or bad Quality of either the Red Globules or Coagulable Lymph. It is hard to ascertain the exact proportion of the Red Globules as we never can get them entirely separate from the Coagulable Lymph. even the Coagulable Lymph too always carries wth it a considerable Quantity of Serum. Some have supposed that an excess of the Quantity of the Red Globules might be determined by their Specific Gravity as they alone are heavier than water. But this cannot be done



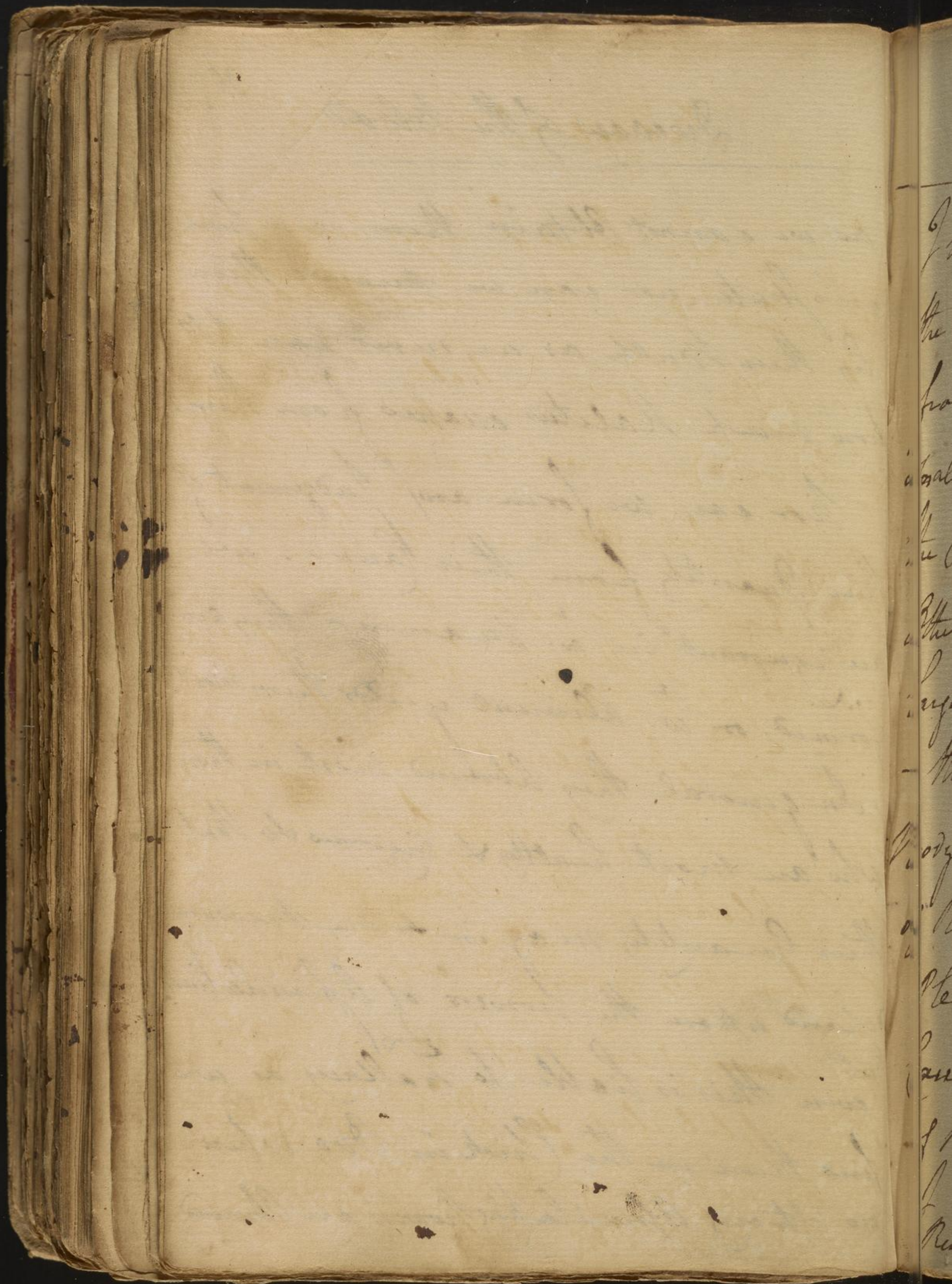
Diseases of the Blood

357

as we cannot Obtain them in a pure
state, nor can we measure them
by their Bulk as we never can tell
how much Kalitus escapes from them.

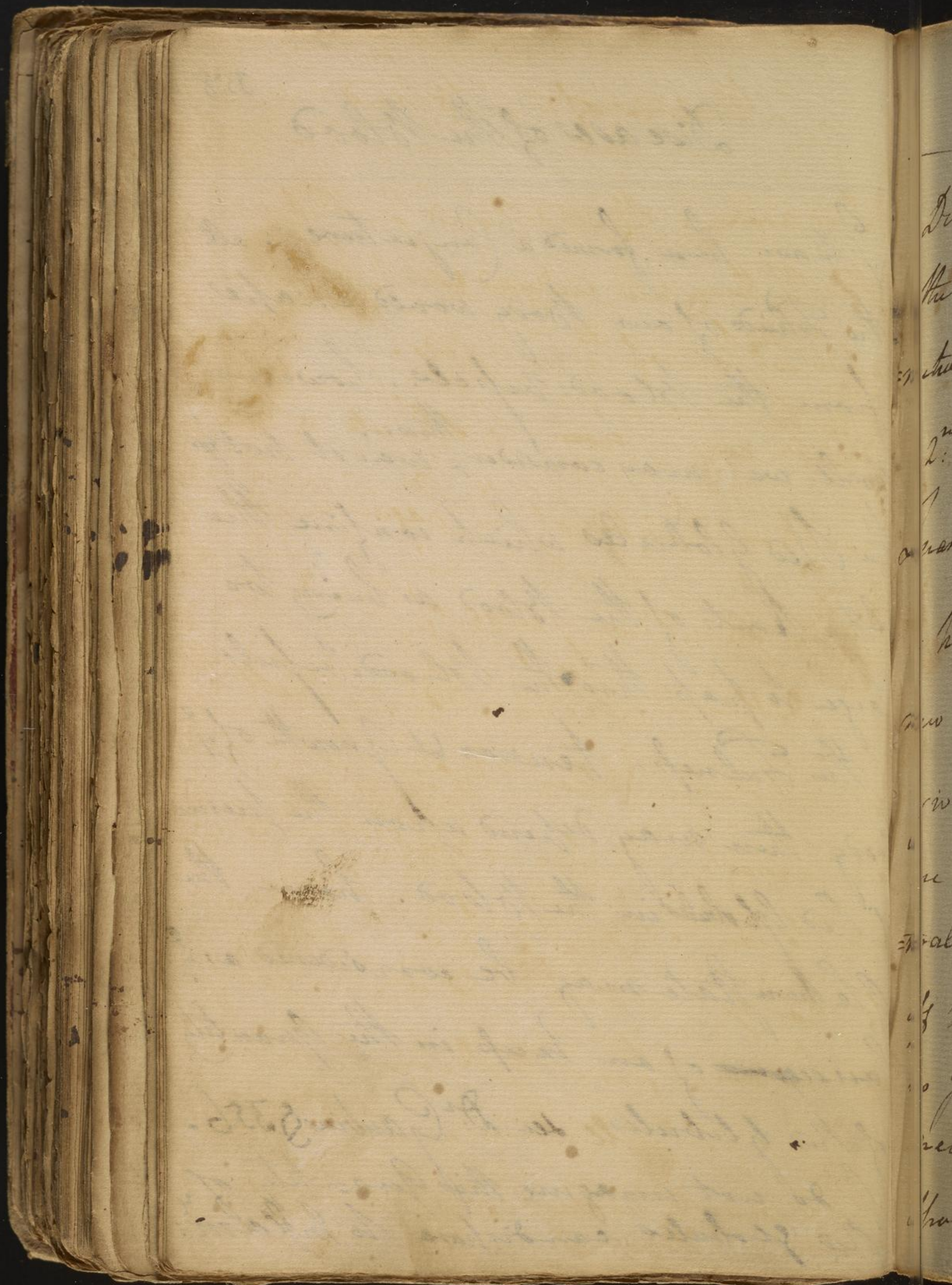
— nor can we form any Judgement of
their Quantity from their Causes. we
are ignorant in w^h manner they are
formed, or w^h aliment y^eields them most.

— In general they abound most in those
who are most healthy & vigorous so that
their Quantity may in some measure
depend upon the powers of Assimilation.
But even this is liable to Fallacy as we
find them in the Chick in Broo where
no strong Assimilating powers are Observed.



Diseases of the Blood

I have here formed a Conjecture. all
 the Fluids of our Body would escape
 from the blood: vessels, however
 small we may consider ^{them,} was it not for
 the Red Globules which confine the
 other Parts of the Blood as being too
 large to pass thro' the blood: vessels.
 - the Pulses - tension & Growth of ^{the} Body
 then may depend upon the presence
 of Red Globules in the Blood. hence the
 Plethoric state may be considered as ^a consequence
 of an excess in the Quantity
 of Red Globules. see Dr. Gaubius § 356.
 I do not imagine this Quantity of
 Red Globules can disperse to Inflamm.

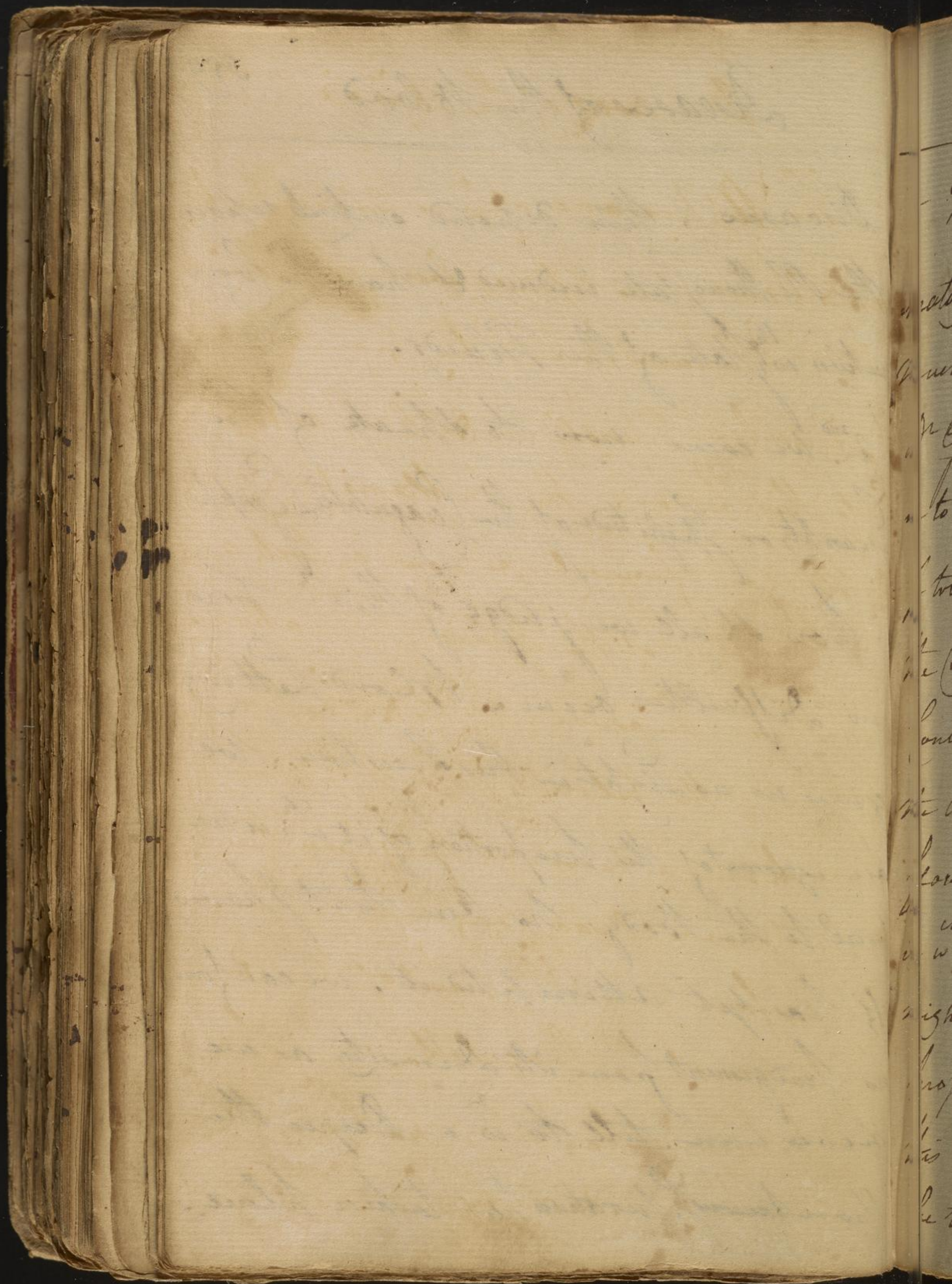


Diseases of the Blood

359

Diseases. These depend entirely upon the Plethoric state induced, & have no connection with the state of the Fluids.

2nd we come now to speak of the Quantity or Spicitude of the Coagulable Lymph. - how shall we judge of this? here new Difficulties occur. Blood: Letting give us no Light in this Question. we are ignorant of the proportion of it w^{ch} is natural to the Body. No one that I know of has yet attempted it. we can form no Judgment from its Density as we never can tell to w² a Degree the Spontaneous Separation has taken place.



The Appearance of w is called Inflammatory Crust is no less fallacious, however much Physicians may infer from it. Even Dr Gaubius himself in §367 has fallen in to this Error. This Inflammatory Crust I told you formerly depends entirely upon the Circumstances of the Blood's Operation. Could we measure the Temperature of the Air - the velocity w w : the Blood flows from a vein & the given time in w : Blood always coagulates, then we might form some judgement of the Over proportion of the Coagulable Lymph, but this Experiment has not, nor indeed can be tried w any decisive manner. We

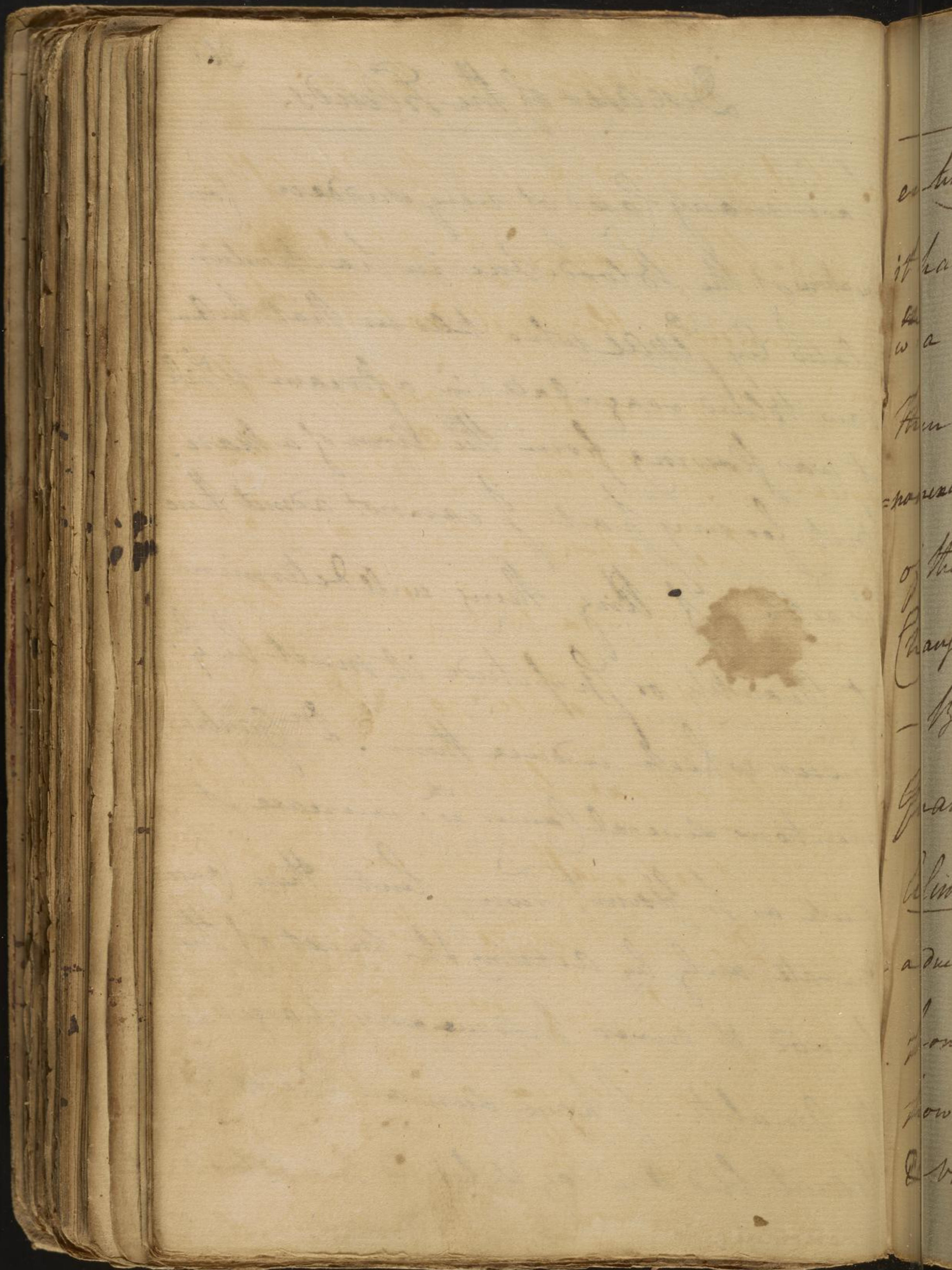
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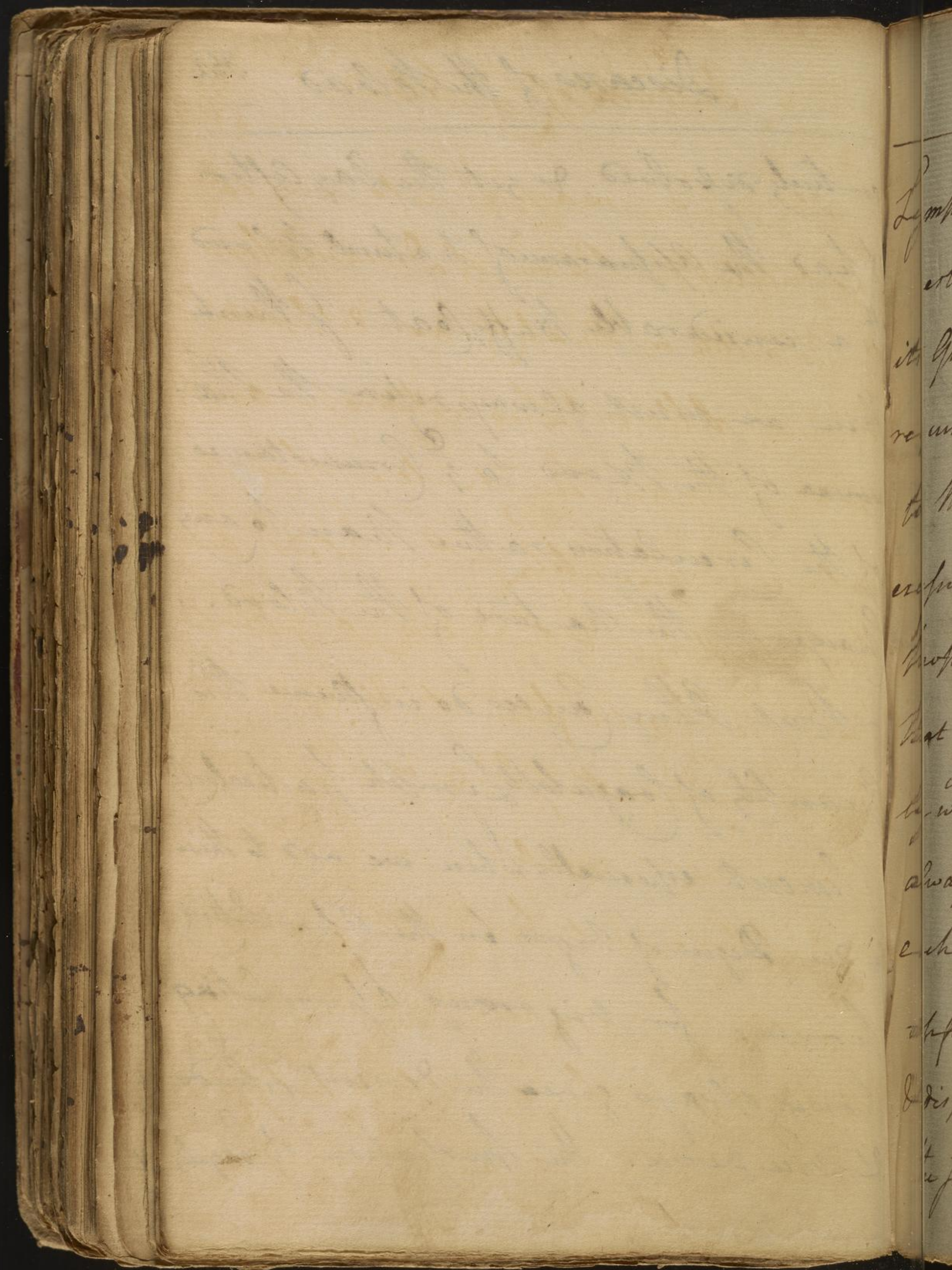
Diseases of the Fluids.

361

have many cases of very sudden con-
densation of the blood. One in particular
related by Jenal who tells us that he once
saw blood coagulate in a stream while
it was flowing from the arm of a man.
But for my part I cannot admit these
facts. If any thing will determine
its quantity or spicitude it must be by
causes which induce them. Dr Goubaux
mentions several causes w^{ch} increase it
such as Inflammⁿ, Lues, but these causes
operate only by altering the mixt of the
blood & never produce any change upon
its quality. I have seen an Epileptic
Patient bleed one day & found his blood



entirely dissolved, & yet the Day after
it had the Appearance of natural Blood
th w: a considerable buff coat. I think
then we must always refer the Pha-
nomena of the Blood to $\frac{2}{3}$ Circumstances
of the Circulation rather than to any
Changes in the Nature of the Blood.
— But Other Causes do influence the
Quantity of Coagulable Lymph particularly
Climate especially when we add to this
a due Degree of Vigour in the Assimilating
power. for vigorous assimilating
power always gives the densest Fluids
& vice versa. the proportion of Coagulable



Diseases of the Blood

363

Lymph is increased w: ^{the} Life. we cannot
establish the Presence of Diseases from
its Quantity or Quality, as different Men
require different proportions of it according
to their Manners of Life. When it is
excessive in Quantity the Solids become
proportionally rigid & thus resist any Diseases
that might arise from it, & vice versa
by w: means the Solids & Fluids are
always kept nearly in a Balance to
each other. But further another Cause
appears to increase the Coagulable Lymph
& disposes it to be ^{more} quickly dissolved in
the serum, so that an Error in the

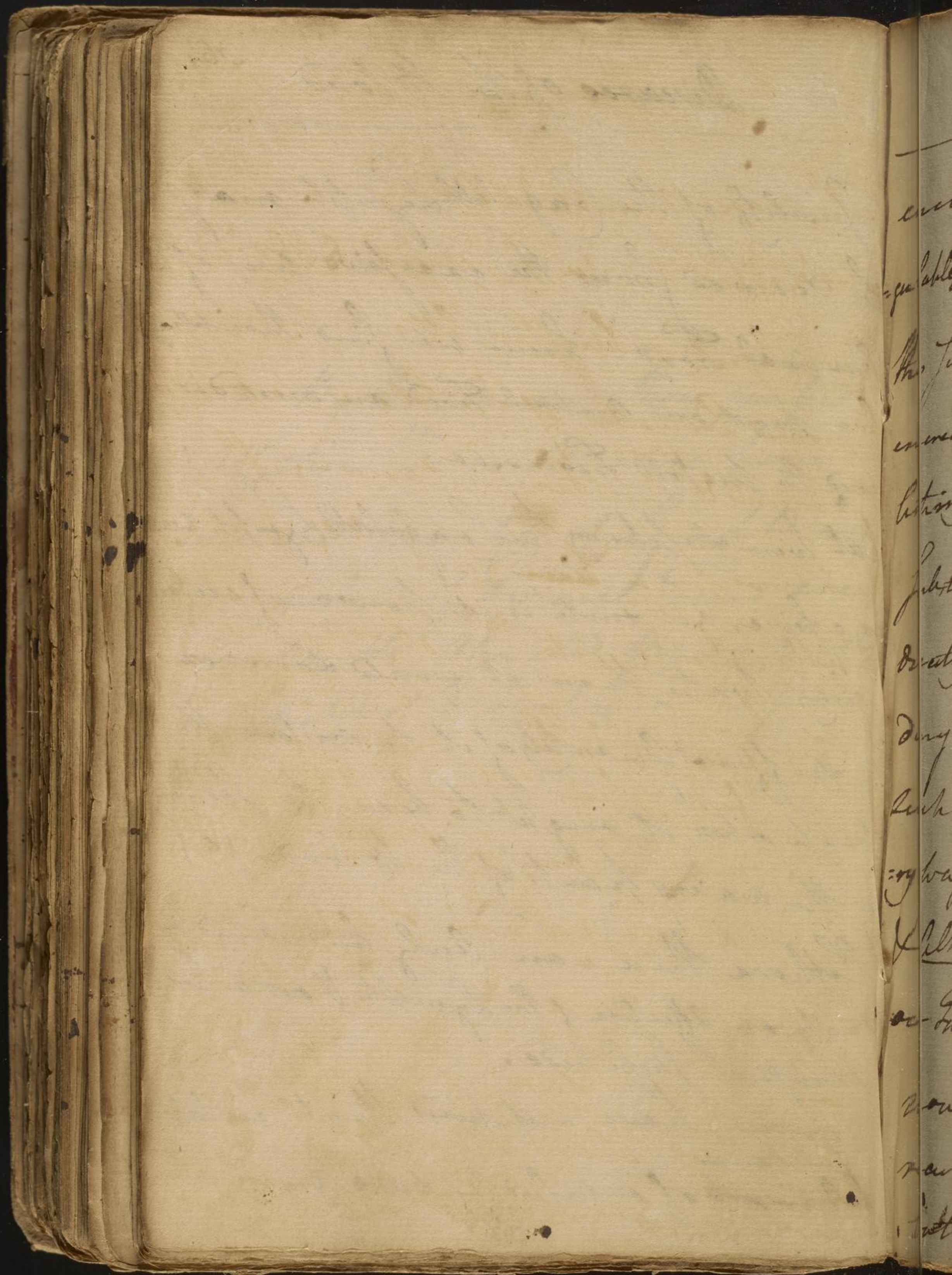
(c). By this means those morbid
affections ⁱⁿ might arise from an
increased quantity of Lymph in
consequence of animal Food are
constantly abated viz by the quick
or solution of the Lymph in the serum.

Quality of the Coagulable Lymph may be derived from the excessive use of Animal Food - hence we find those who live most on Animal Food are most disposed to putrid Fevers. (a)

But even supposing the Coagulable Lymph was excessive, yet such is its power of coagulating water than it would soon receive a sufficient quantity of it to restore the proportion it ought to bear to Serum, or the watery parts of the Blood. (a)

Plethora then can only be induced by such an affection of the Lymph, & not a preternatural spissitude.

Some have supposed that certain Substances of a viscid nature given an



Diseases of the Blood

365

increased Quantity & Density of the coagulable Lymph. See Dr Gaubius § 367. upon this subject, where he attributes an increased Density of the Blood to certain Astringents & Spirituous Substances. These Substances have ~~some~~ such Effects when directly injected into the Blood, but if any thing being able to produce any such Effects when taken in, in ^{the} ordinary way mixed w: our Diet. Even Liquids & Alcohol are capable of coagulating our Fluids only in a very concentrated state. now we are sure they never can reach the Blood in any other way. but in the most diluted state. the

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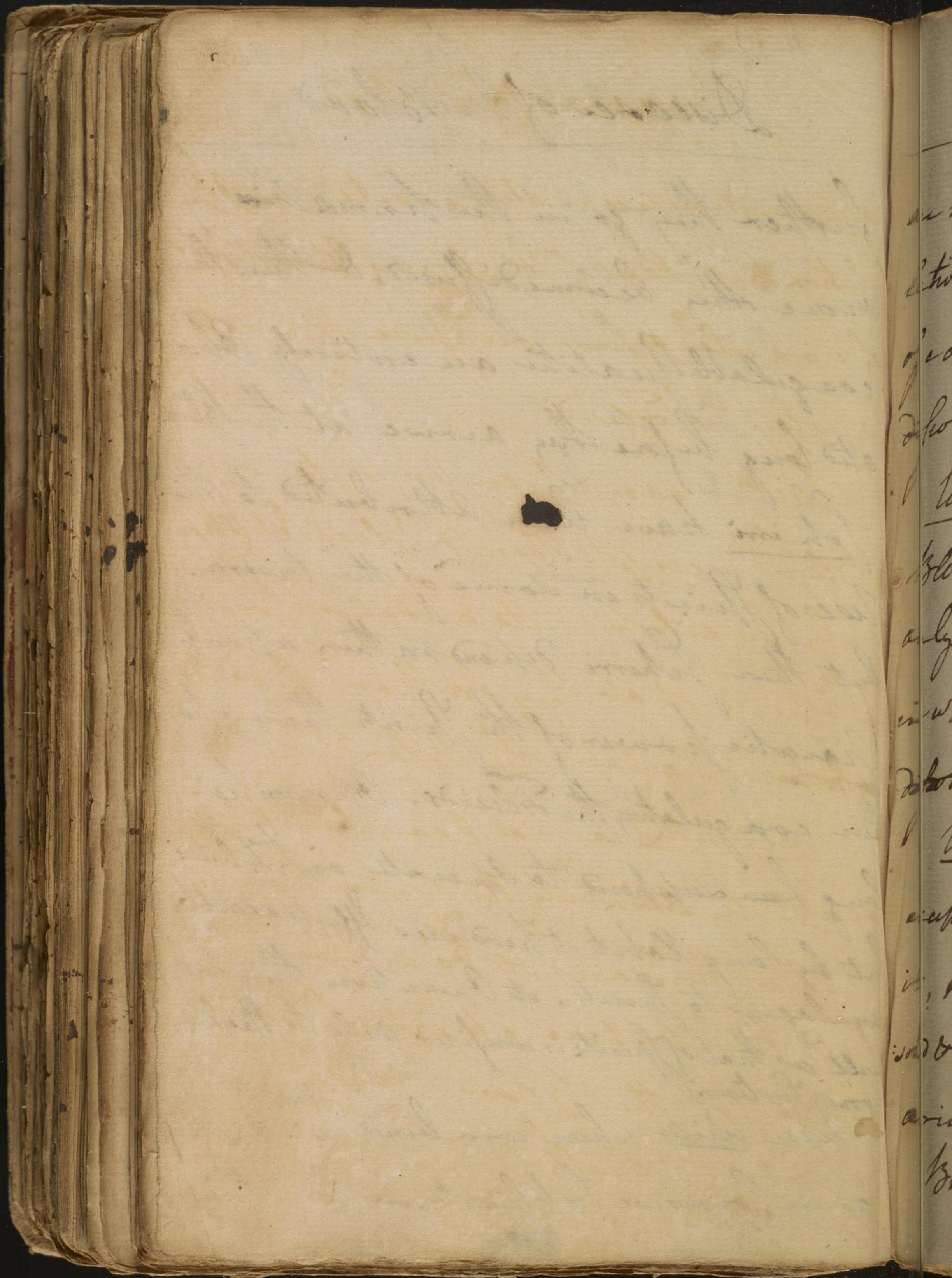
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Diseases of the Blood

366

further they go in the Primæ Viæ, & ^Q
more they become diffused, & thus their
coagulable Qualities are entirely Abor-
ated long before they arrive at the Blood.
Scirrhi have been attributed to the
Use of Spirits in some of the viscera.
but these Scirrhi depend rather upon ^Q
Narcotic power of the Spirits than upon
their coagulating the Fluids. Opium has
long been supposed to Operate on ^Q Fluids
but by long Habit it produces Effects exactly
analogous to Spirits. its Operation then as
well as that of Spirits is confined only to the Ner-
vous System.

Even Acids when combined w: Metals th
as in Corrosive sublimate, in w: they th



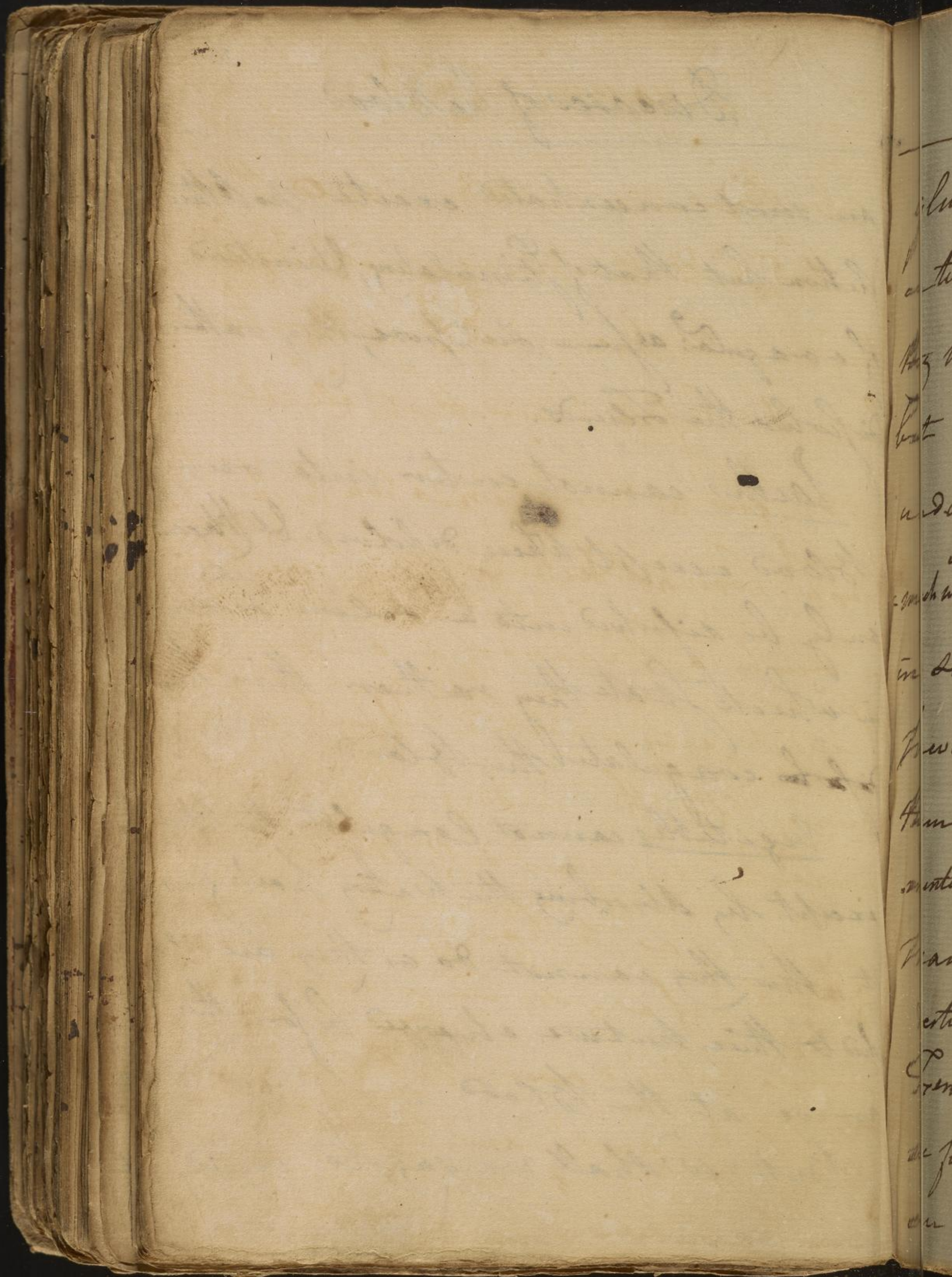
Diseases of the blood

are most concentrated excite no other action but that of stimulating, & instead of coagula: as some suppose, they rather dissolve the fluids.

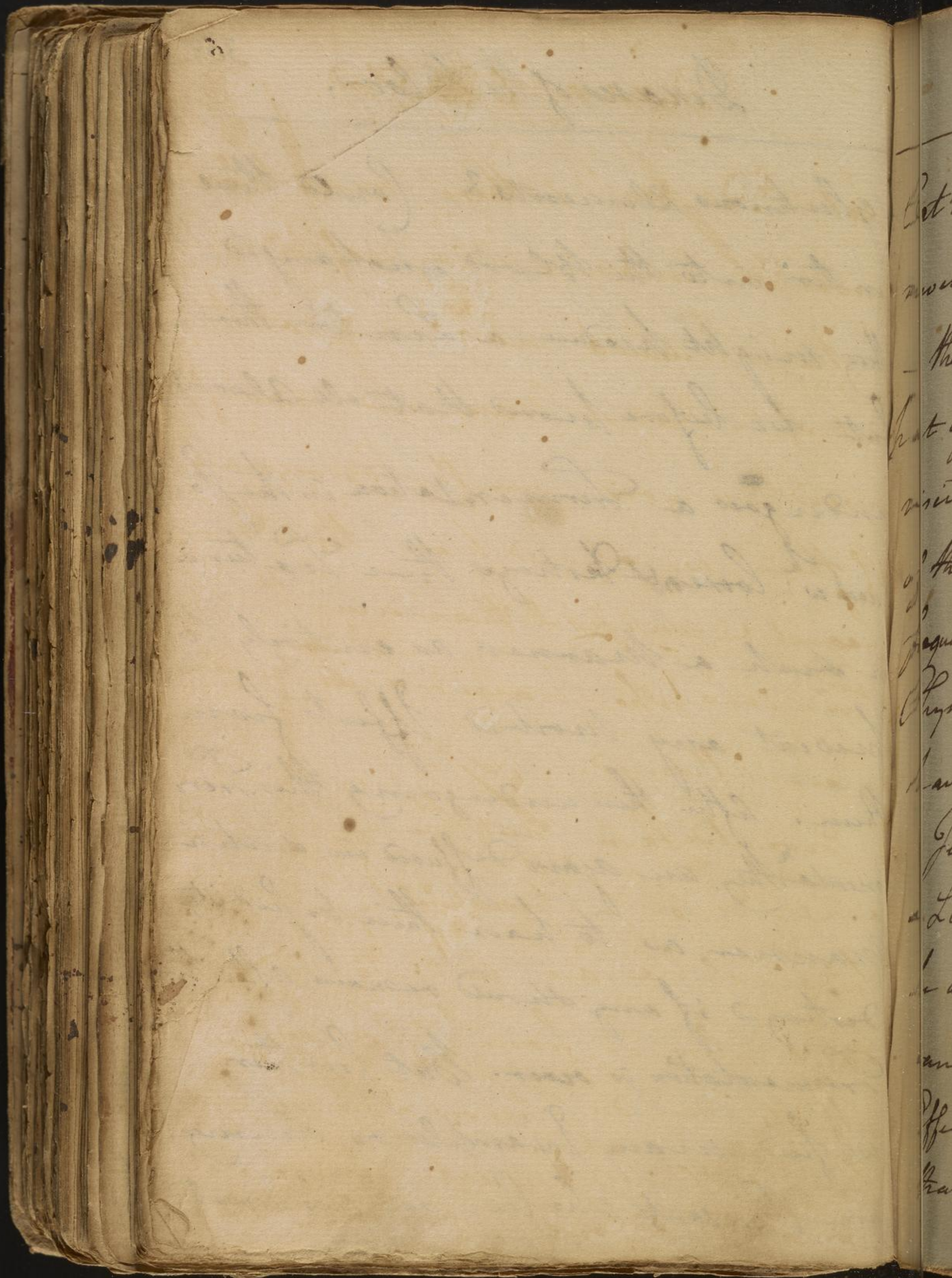
Acids cannot enter into our blood except when dissolved. & they can only be dissolved into a saline form in which state they rather thin than ~~dissolve~~ coagulate the blood.

Vegetables cannot coagulate the blood except by absorbing the watery parts from it, this they cannot do as they are dissolved & their nature changed before they arrive at the blood.

But w^h shall we say to viscid

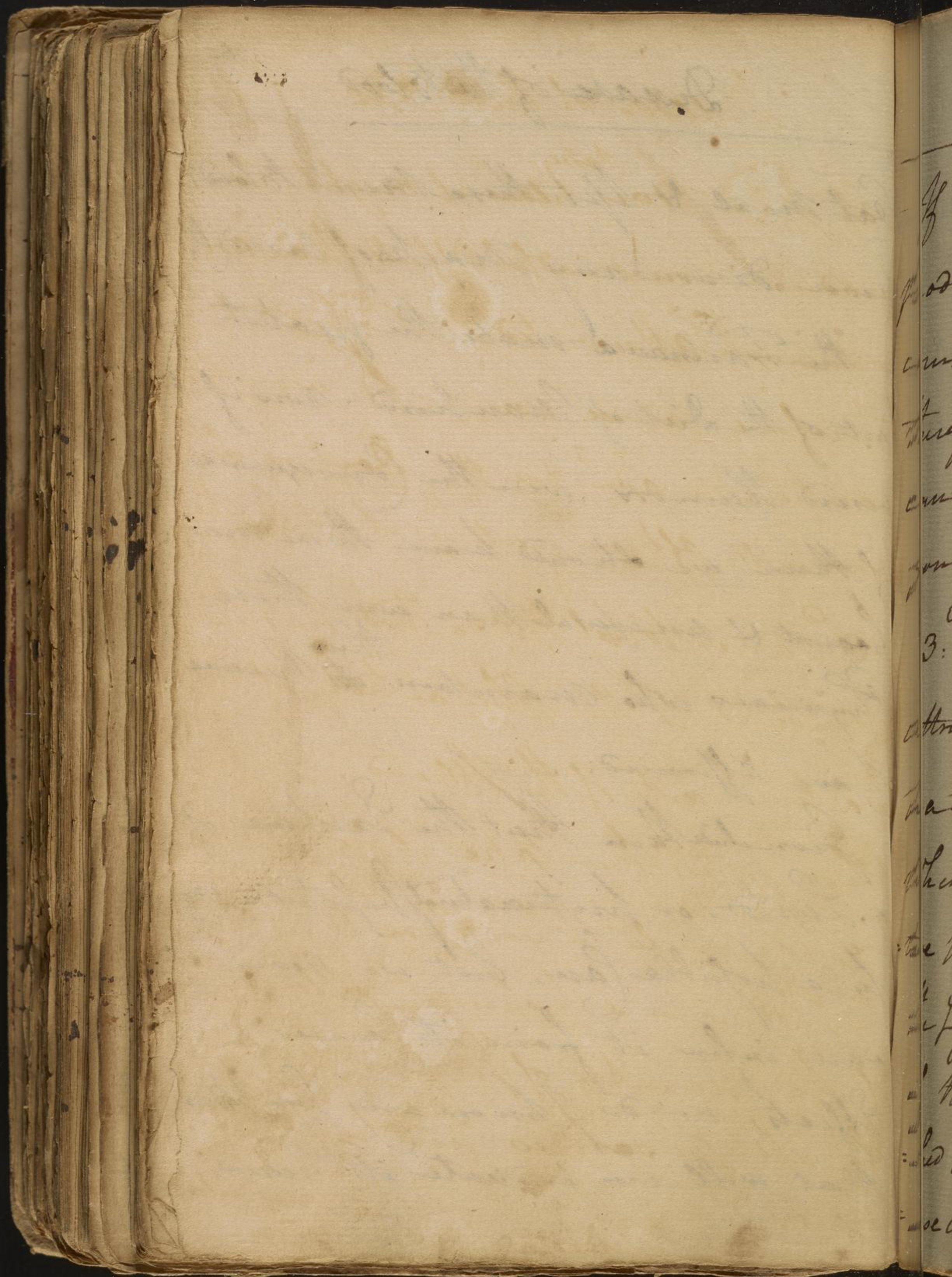


glutinous Aliments? Could these enter into the blood unchanged, they might produce a Lenton there, but we before proved that all Aliment undergoes a Fermentation in the stomach: ^{It} loosens & destroys their Texture in such a manner as entirely to prevent any morbid Effects from them. After this undergoing this Fermentationⁿ they are again diffused in such a manner as to have their viscidities destroyed if any should remain after the Fermentation is over. But further, we find many Examples as among our Peasants who live on unfermented



eat meal, & yet these Men's Bloods
never discover any Marks of viscosity
— the Farinae make the greatest
part of the Diet of Mankind. now if
viscid Humors were the consequence
of them, we should have them more
frequent & universal than even those
Physicians who maintain ^{their} ~~its~~ Presence
have affirmed.

I conclude then that the Existence of
a Lector, or preternatural spirititude may
be a possible case, but we never
can infer it from its causes or
effects, nor do I know any Symptoms
that will ever indicate its Presence.

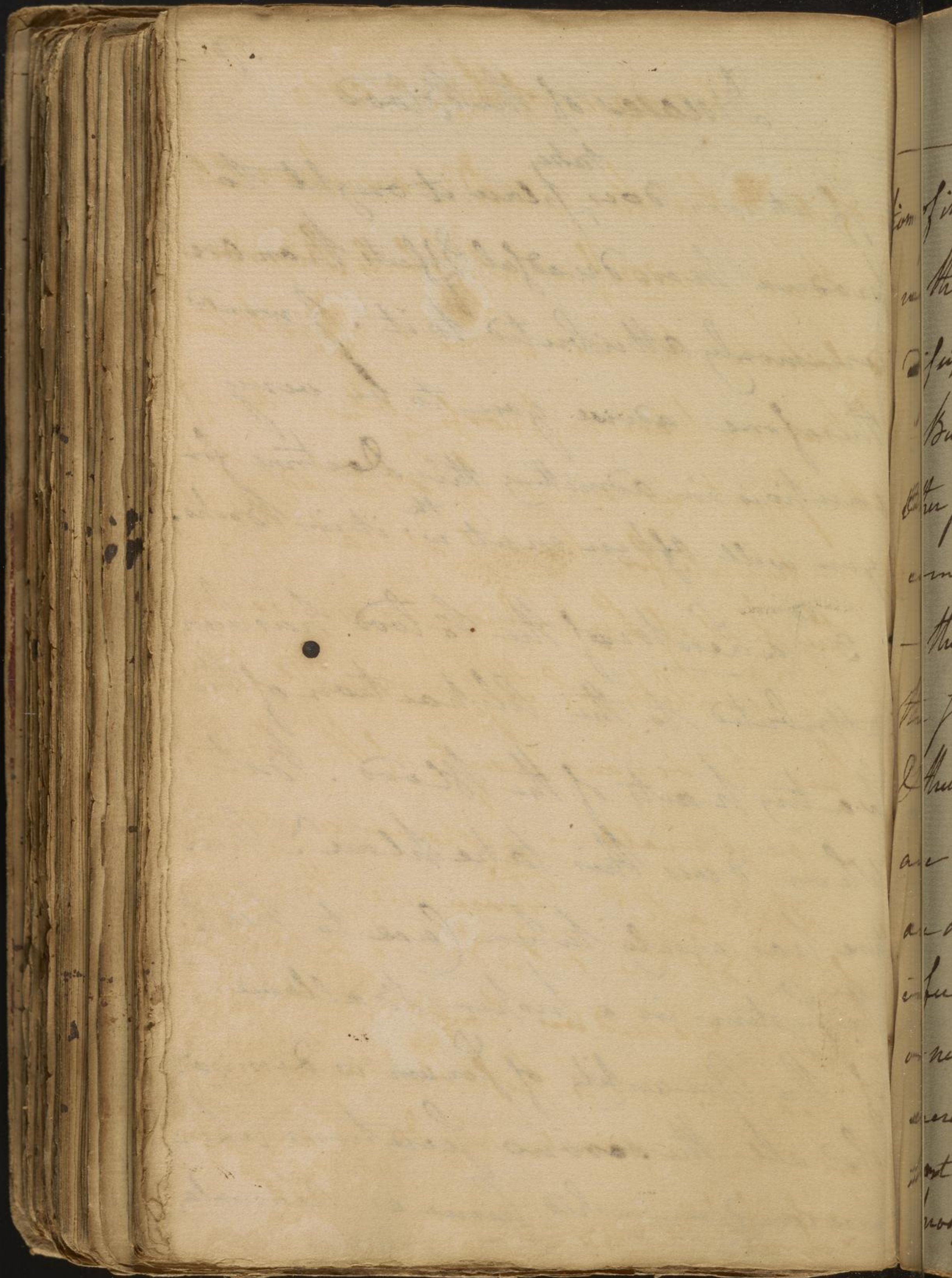


Diseases of the Blood

370

If it ever ^{take} place it ought to produce more dreadful Effects than are commonly attributed to it. I would therefore advise you to be very cautious in admitting this Doctrine for you will often meet wth it in Books.

3.^d a Lentor of the Blood has been attributed to the Absorption of the watery parts of the Blood. But when does this take place? Nature has wisely taken care to keep the System in a proper Balance. if the Quantity of Serum is diminished all the ~~serous~~ secretions likewise are diminished, hence an Accumula-



Diseases of the Blood.

371

tion of it in the Body. Dr. Boerhaave tells
us that Pudorigies & febrile Disorders
dissipate the watery parts of our Blood,
But we have no proofs of this. Some
Other Ferments must be stopped to
compensate for the Loss of water by sweat.
— the Heat of the Fluids too encreases
the solubility of the Coagulable Lymph
It thus the serous parts of the Blood
are regenerated in proportion as they
are dissipated. From all this I w.
infer that the Fluids are seldom
or never diseased by having their Density
encreased. It is a possible ^{case} only. For my
part I never saw it, nor do I know any
proofs of it.

372

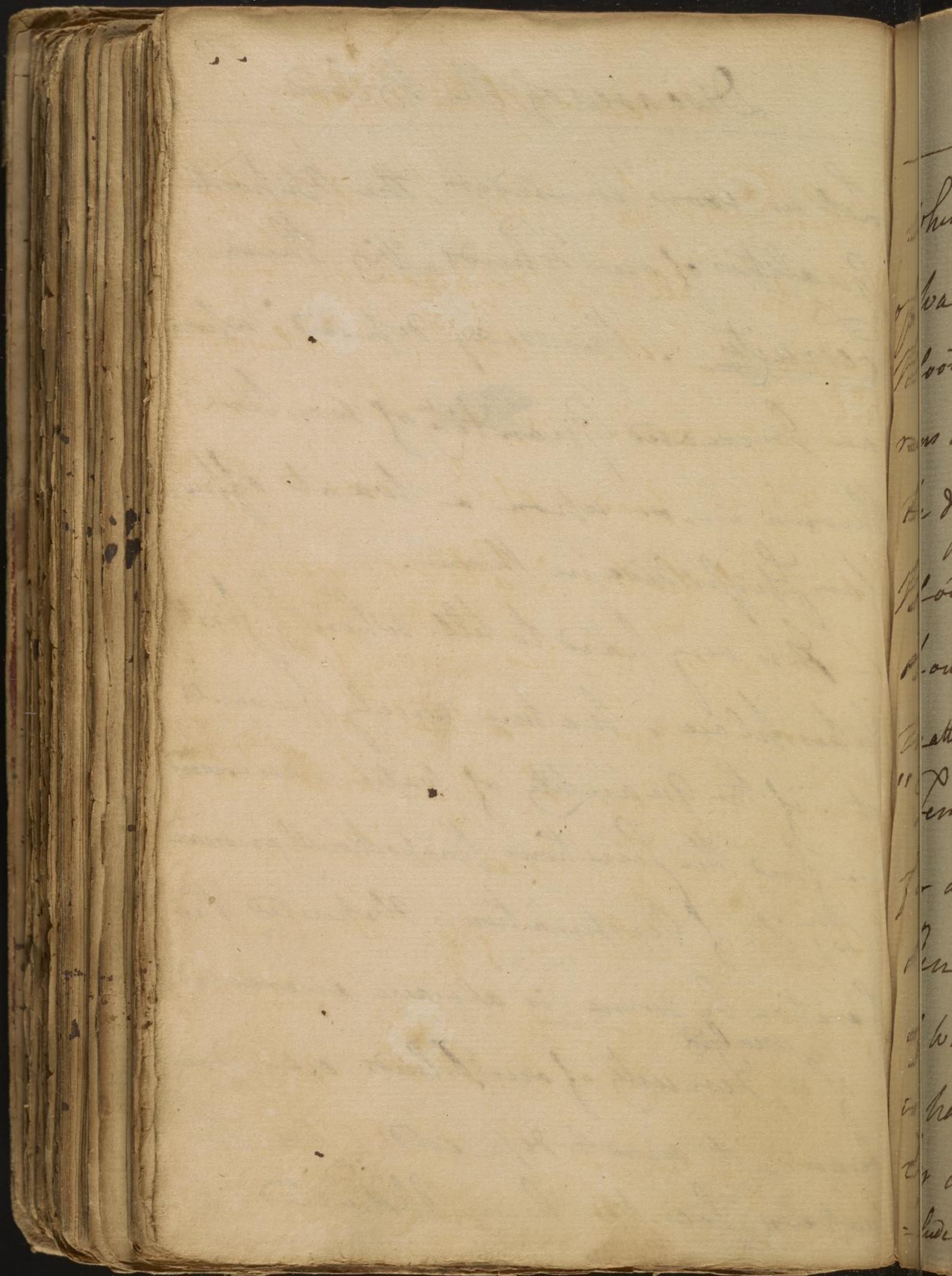
Diseases of the Blood.

Let us now consider the Opposite Qualities of our Fluids viz their Tenuity. This may depend upon an Increased Quantity of water thrown in, or upon a want of proper Spirituosity in them.

It is very hard to tell when $\frac{1}{2}$ first takes place. Nature wisely prevents it. if the Quantity of water is increased we find the secretions proportionally increased. ^{the} ~~is~~ it. if Perspiration is obstructed the

Secretion by urine is always increased.

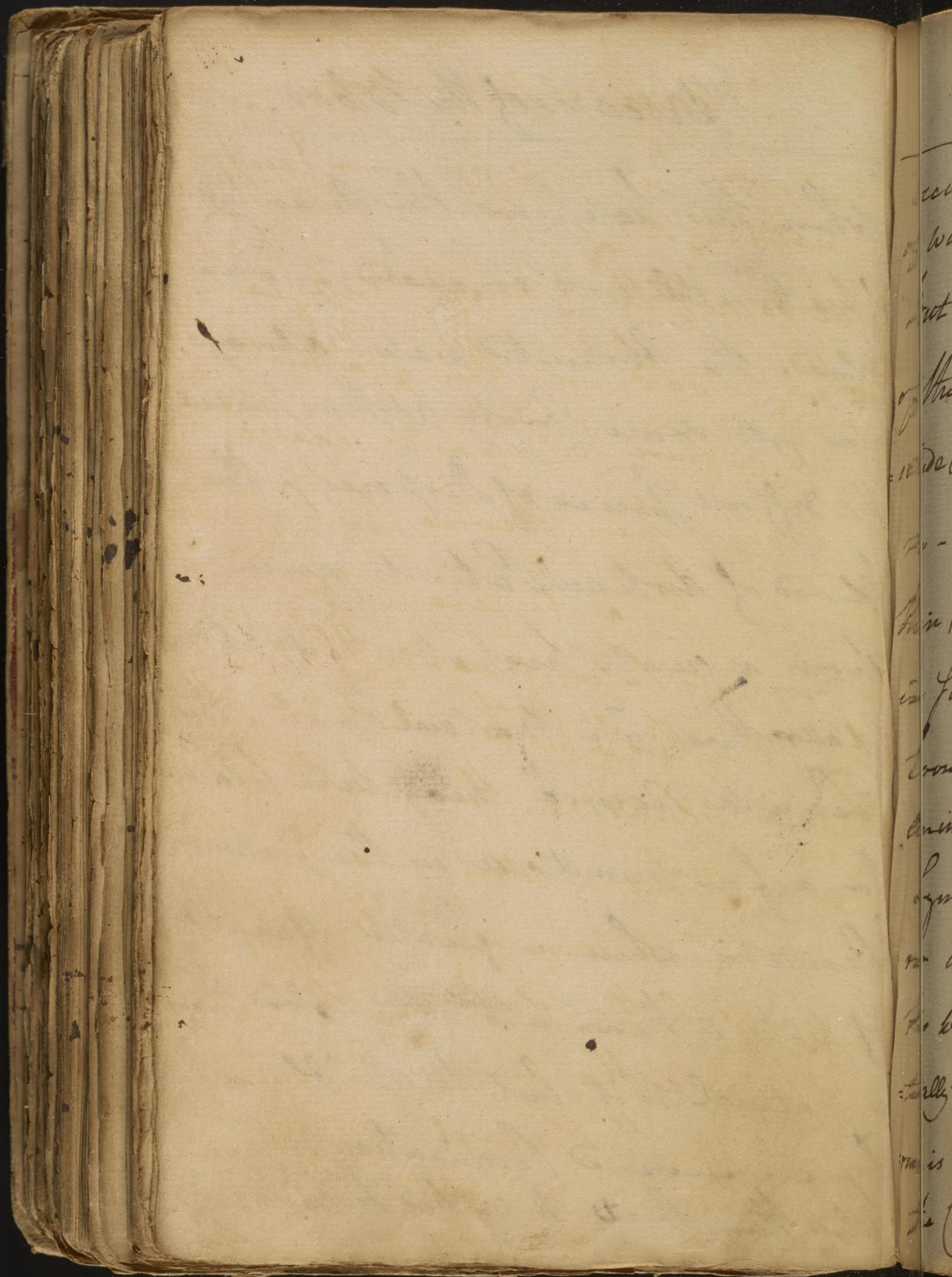
- if a ^{morbid} Tenuity of our Fluids ever does occur, it must depend on the watery Secretions being obstructed, but



373

Diseases of the Blood.

When this happens the Quantity of water is still not increased in our Blood. the obstructed water always runs into same cavity & thus produces the different species of Dropsies. the Blood of dropical Patients never shows a greater proportion of watery matter than is natural to it. the "Tenuitas Aquosa" may take place for a few minutes as in the Ichuria Renalis when a greater Quantity of water is thrown into the Blood than is natural to it, but this is alleviated by an increased Perspiration. I conclude then that a morbid Tenuity never



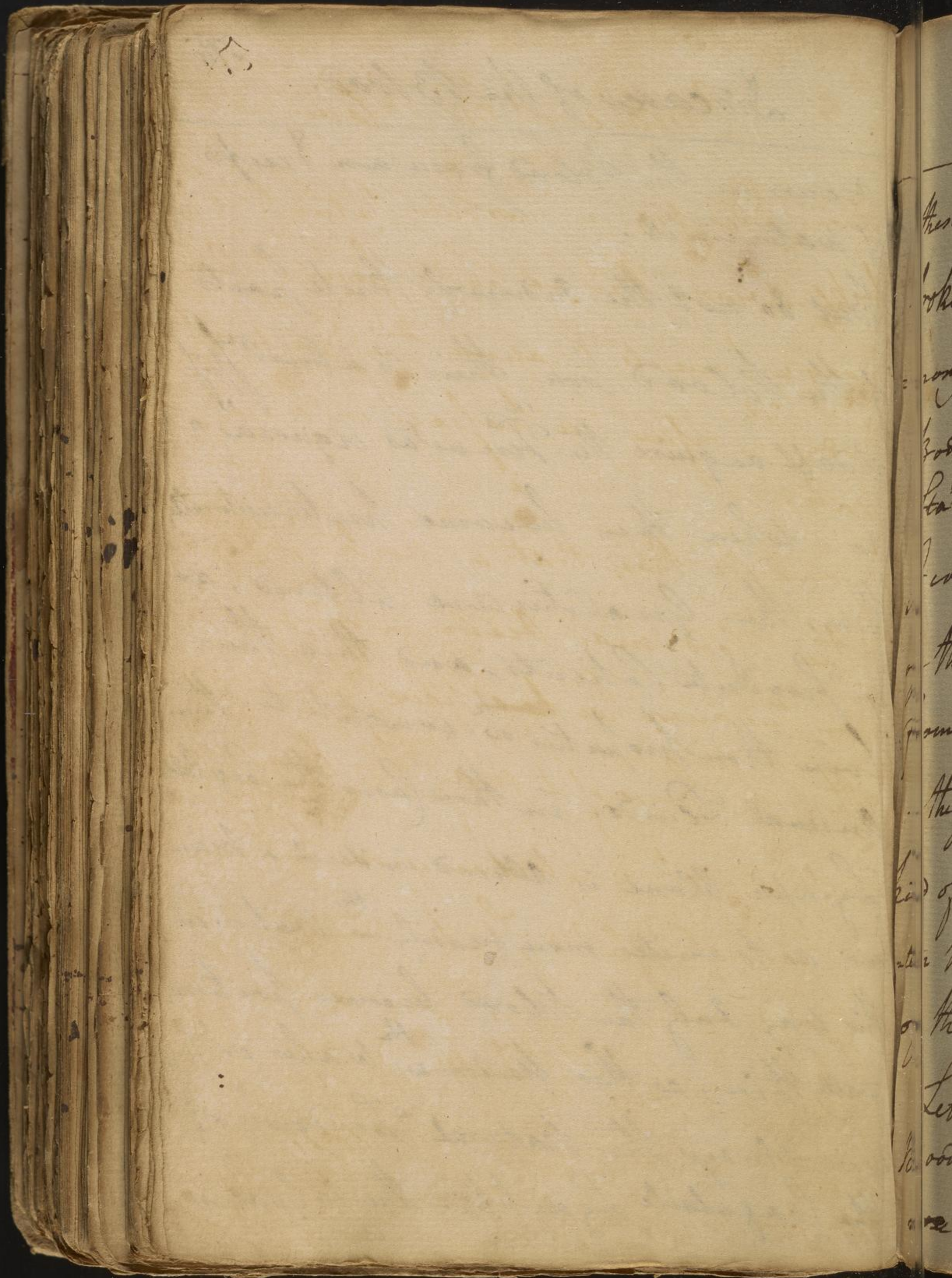
Diseases of the Blood.

374

Occur in the Blood from an excess of water in it.

But do not the ordinarily thick parts of the Blood lose their natural viscosity & acquire the *Tenuitas Aquosa*? no - when they become preternaturally thin, their Qualities are altered, as in Scorbutic Patients, and they thus lose those properties ^{ch} w: constitute them Animal Solids. in those cases the Coagulable

Lymph alone is altered in such a manner as to unite more readily th w: water. in this way only the Blood becomes preternaturally thin, as this Union th w: water or serum is always the natural Tendency of the Coagulable Lymph. the Blood in



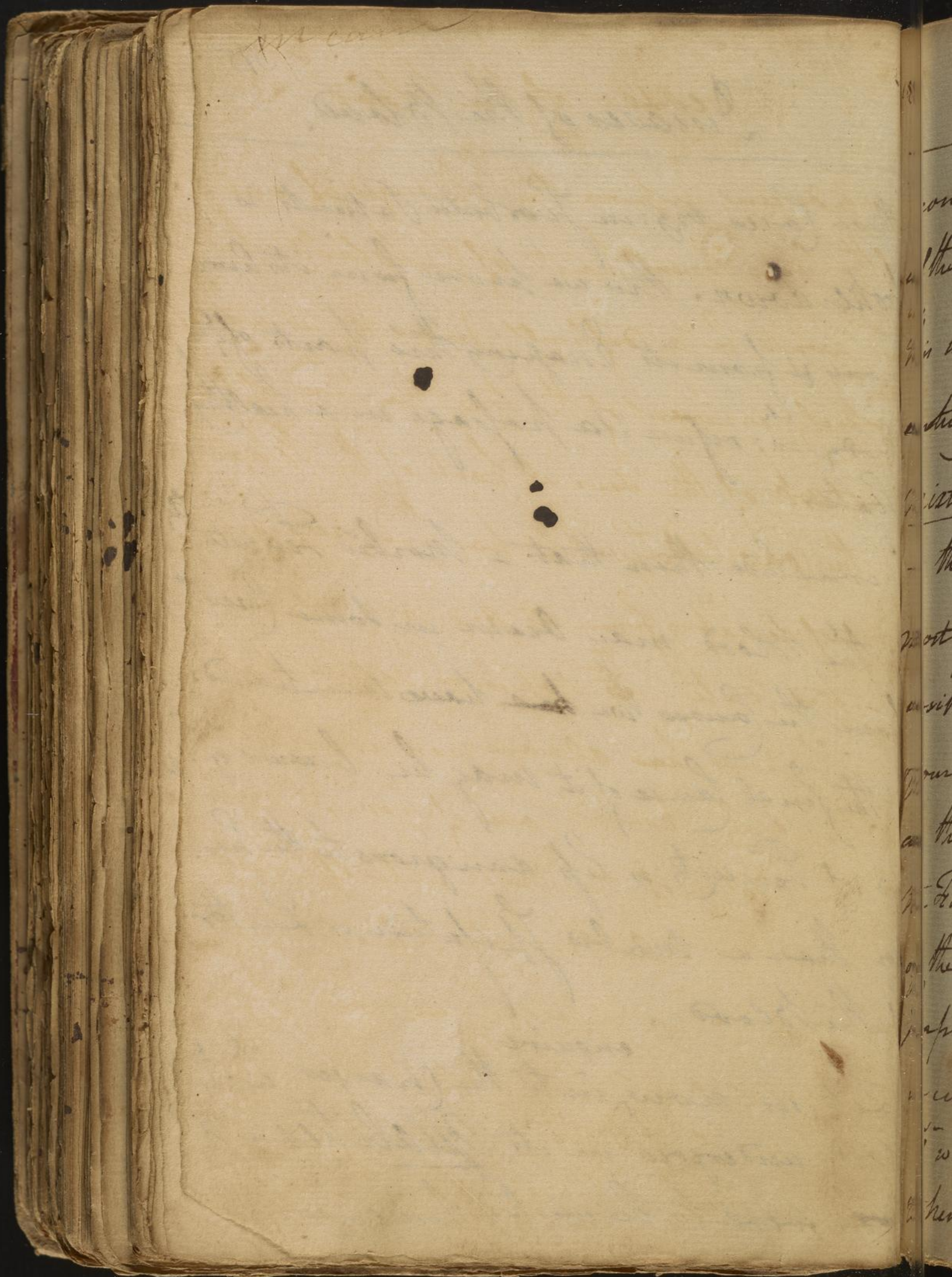
Diseases of the Blood.

these Cases viz: in Scorbutic Patients is broke down. This we prove from its being many & from its Escaping thro' parts of the Body w: refuse its passage in a healthy State.

I conclude then that a Morbid Lenuity of the Blood may occur in some Cases from the Causes we ~~have~~ have mentioned.

The final Cause of it may be because of this kind of Lenuity is less dangerous to the System than a Morbid Spifutide or Lentor of the Blood.

Let us now ^{enquire} into the Changes ^{in e} w: y. the Blood undergoes in its Qualities. If ~~we~~ were to be wished here we could



condescend upon the Changes of each of the Component parts of the Blood, but this would be a difficult Inquiry, as we are entirely ignorant of the true Nature of the Mixture of the several parts of the Blood. — the Coagulable Lymph has been accused most of deviating from its ordinary bland insipid state. ^{the} Sapid or saline state of our Fluids has always been considered as the Only Morbid Cause of them, & hence the Foundation of the much talked off Aerimony of the Blood. As this is a Question of Importance we shall spend some time in enquiring into it. —

i we shall Observe the Care Nature has taken to Abviate Aerimony in our Fluids.

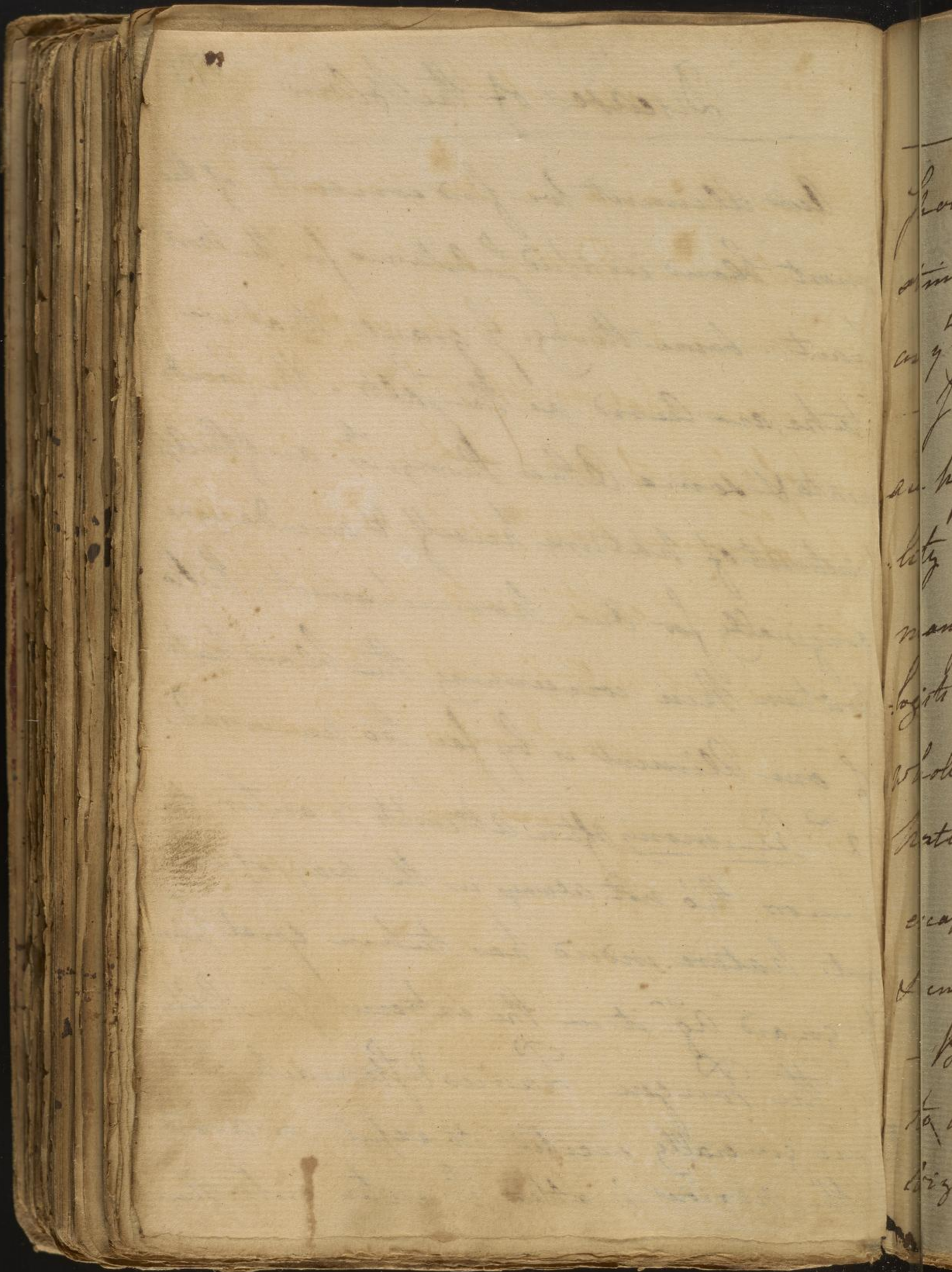
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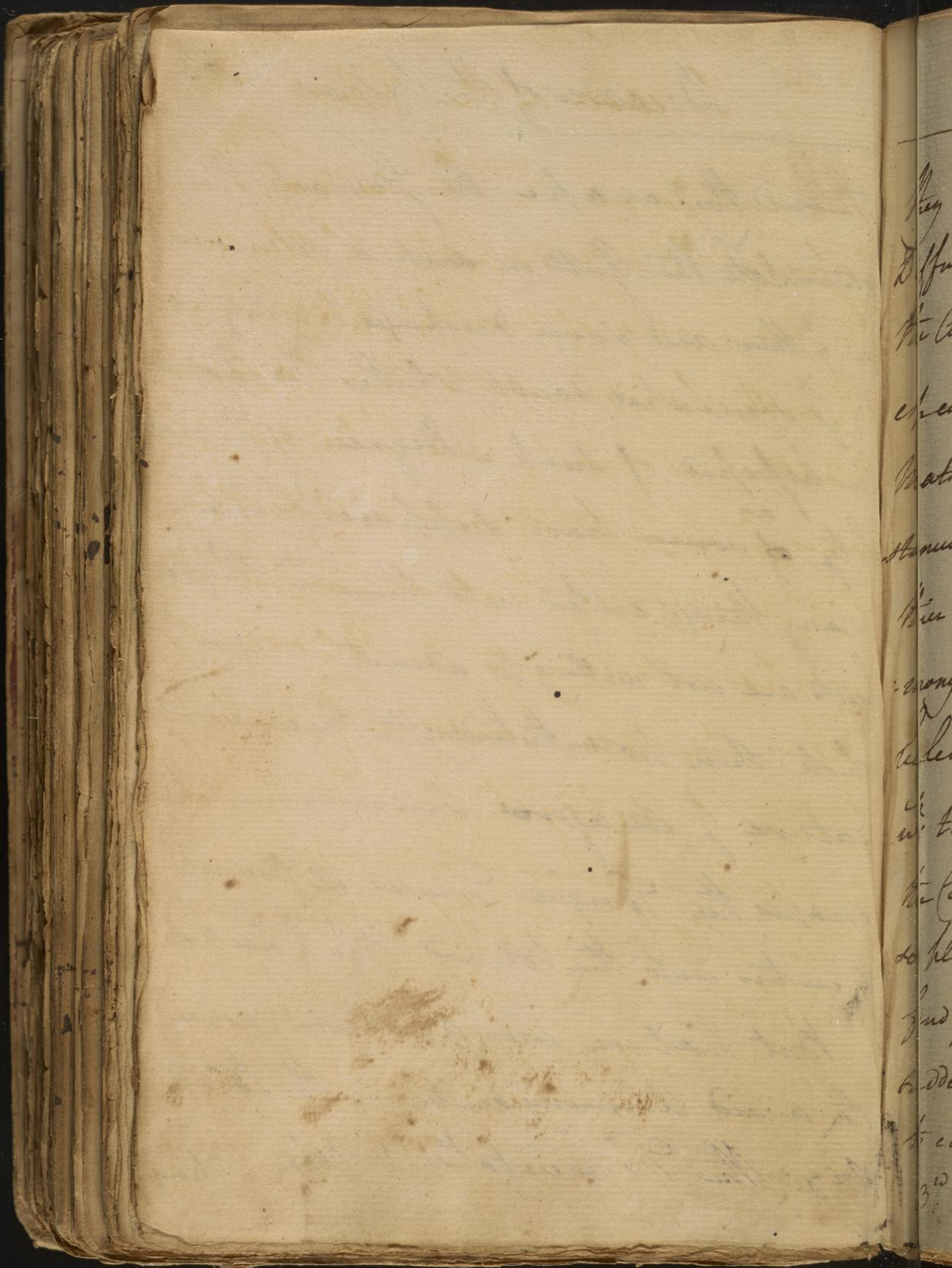
Diseases of the Blood 377

- Our Aliment we find consists of the most bland insipid substances for the most part. Some things I grant that we take, are curid as the salts - the Condiments & some other things ^{ch} are of the appointment of nature herself, & were designed originally for our nourishment. The proposition then concerning the bland nature of our Aliment is by far too universal.

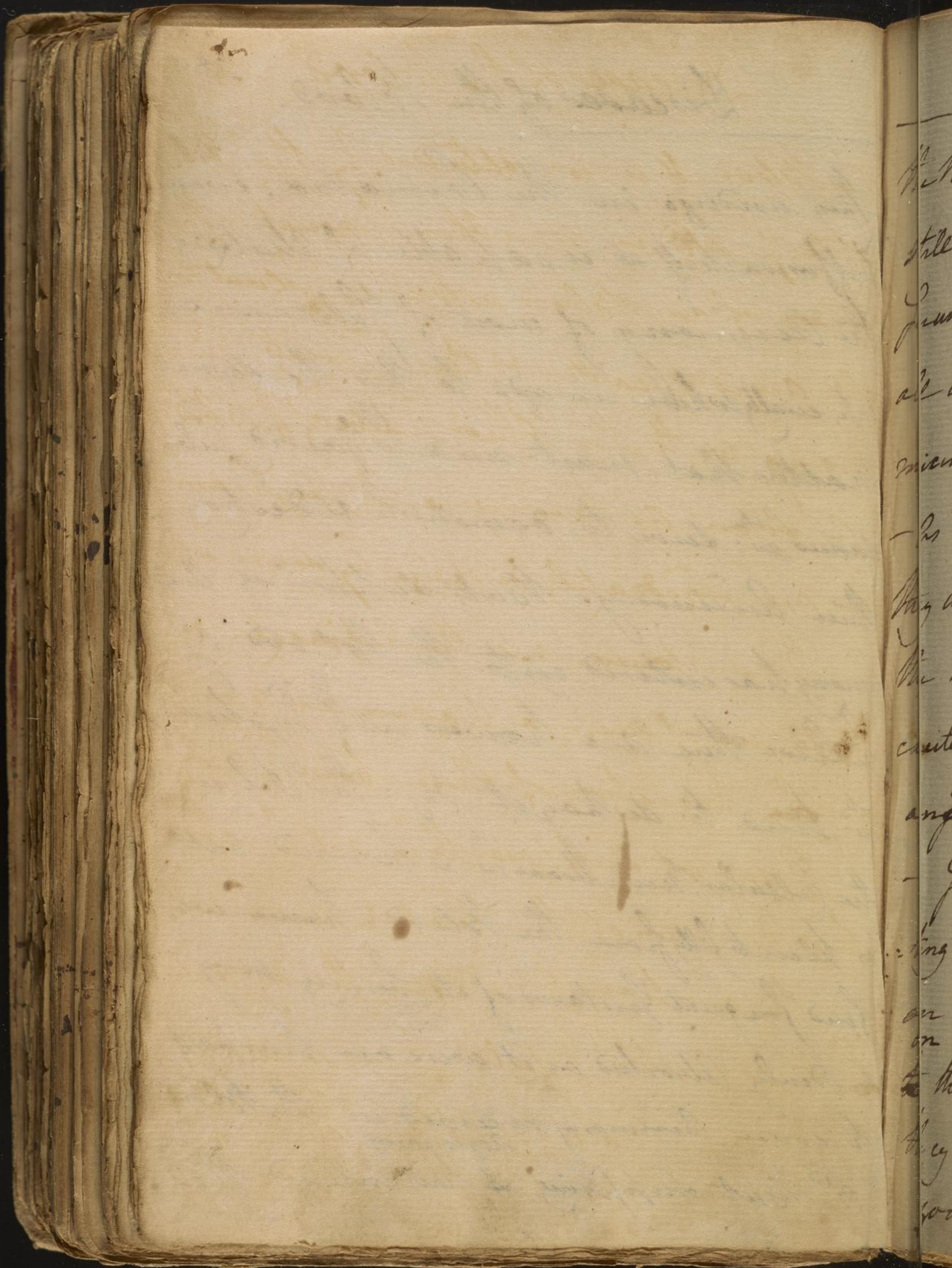
2nd Perimony often attempts to enter the humors tho' not always in the way of Aliment. Nature indeed has taken great pains to guard agst it in the extreme sensibility of the Tongue - Larynx & Stomach ^{ch} w^h are generally excited to expel or avoid the noxious matter ^{ch} w^h enter into them.



Should they escape the stomach they
stimulate the Guts in such a manner
as if they are soon discharged by a Purg-
- I somewhat doubt whether the Lactals
are possessed of such a degree of sensibi-
lity ^{as} some have supposed; I believe
many things enter into them ⁱⁿ Physio-
logists are not willing to admit. upon y^e
whole then notwithstanding the Precautions of
Nature I imagine Acrimony sometimes
escapes the Tongue Fauces & Stomach
& enters into the Blood thro' y^e Lactals.
- But Nature uses another power
to avoid Acrimony entering the Blood
viz: the Fermentation & Other Changes



They undergo in the Primæviæ, even
Diffusion itself & is capable of beating
the Acrimony of most of Substances,
especially when we add to this the several
Matters that must mix wth acid Sub-
stances w^{ch} serve to diminish & destroy
this Acrimony. But supposing Cri-
mony has entered into the Blood, I
believe there are powers in the System
w^{ch} tend to destroy it viz: the Oil in
the Cellular Membrane w^{ch} is poured out
so plentifully from the Blood. hence we
find frequent Instances of its being very
suddenly Absorbed as it were on purpose
to cover Acrimony received in the Blood.
3rd But supposing ^{Acrimony} it has entered the



Diseases of the Blood 390

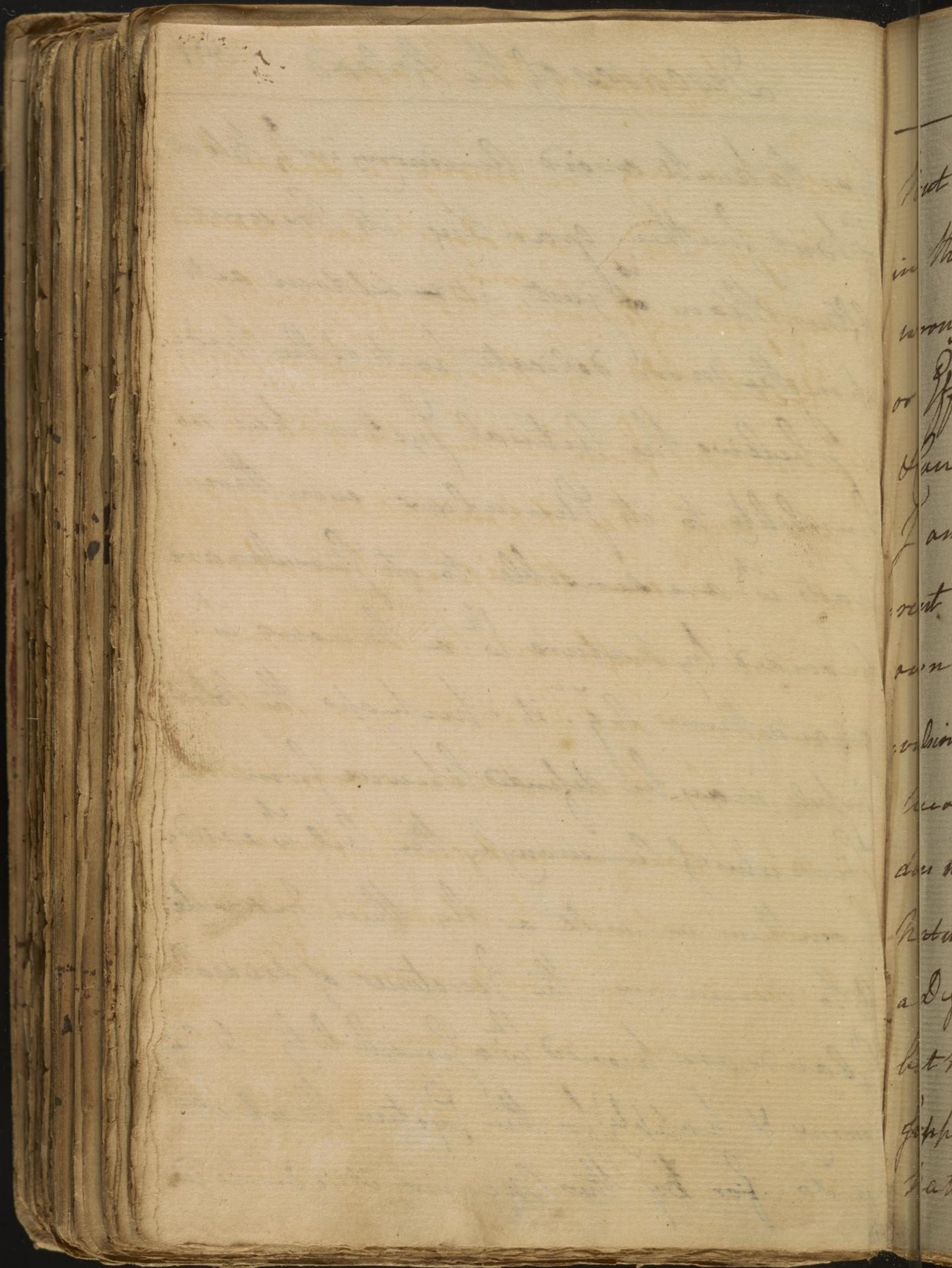
The Blood, & is not attended by the Bil,
still I affirm it is often innocent. The
Serum of our Blood acts as a Solvent to
all acid matters, & thus prevents their
mixing with the other parts of $\frac{2}{4}$ Blood
— As soon as they mix wth the Serum
they are immediately discharged by some of
the Excretories. all the Actions they do
excite are of such a nature as to excite
an ~~ex~~cretion of them from $\frac{2}{4}$ Body.
— I do not suppose they act by exci-
ting the Action of the Heart & Arteries.
on the contrary I imagine they act only
on the excretory vessels themselves when
they are discharged. From all this
you see how much pains Nature

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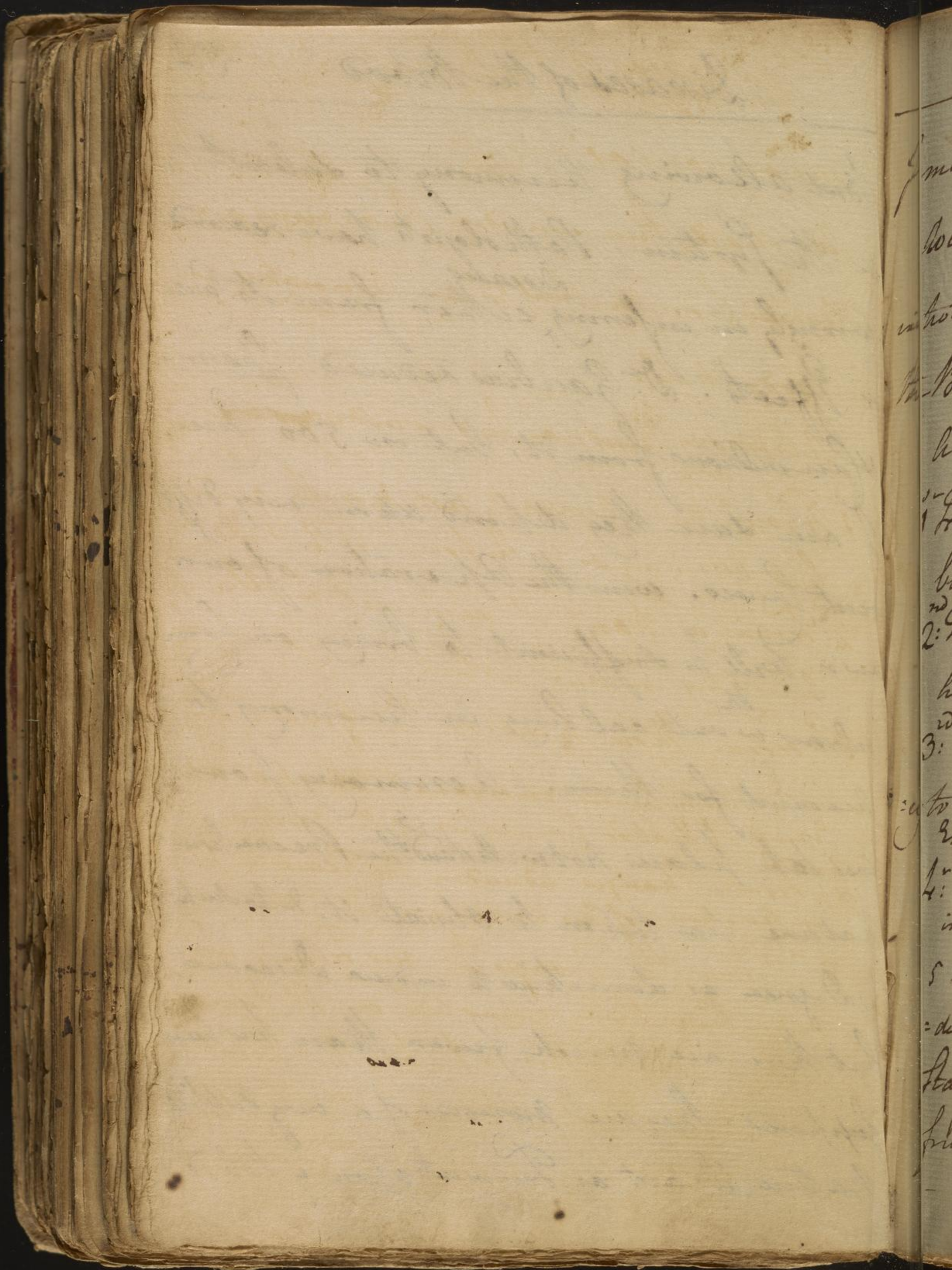
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has taken to avoid leucimony in $\frac{1}{4}$ blood.
4. But further granting its Presence
often than ~~is~~^{is} just, it ~~is~~ seldom acts
upon the more delicate parts of the Body.

I believe the Arterial System has no
Sensibility to its Stimulus. even those
parts w^{ch} are sensible to its Stimulus are
provided by nature wth a Mucus w^{ch}
guards them agst it. perhaps the Blood
vessels may be defended likewise from the
Stimulus of leucimony by the Oil w^{ch} exudes
from them as well as by their Insensibi-
lity to leucimony. the Secretories of several
Glands are provided wth a sensibility to leu-
imony & happily for the System that it
is so, for by this means it is discharged.



But allowing Acrimony to subsist
in the System, Pathologists have reasoned
wrongly in inferring ^{Diseases} either from its Cause
or Effects. Dr. Garbrius deduced Spasms
& Convulsions from it, but in 500 Cases
I am sure they depend upon very diffi-
erent Causes. even the Operation of our
own Will is sufficient to bring on Con-
vulsions ^{the} without calling in Acrimony to
account for them. Acrimony I own
does take place notwithstanding the Precautions
Nature has taken to obviate it, & to such
a Degree as sometimes to induce Diseases,
but these are much fewer than has been
supposed. They are moreover of a very subtle
Nature w^{ch} act as Ferments upon y^e Blood.



I mean Contagious.

We shall then consider Acrimony as introduced from without & as generating in the Body itself.

Acrimony that may be derived ~~from~~.

1st From the Aliment not directly acid but becoming so by the powers of the Body.

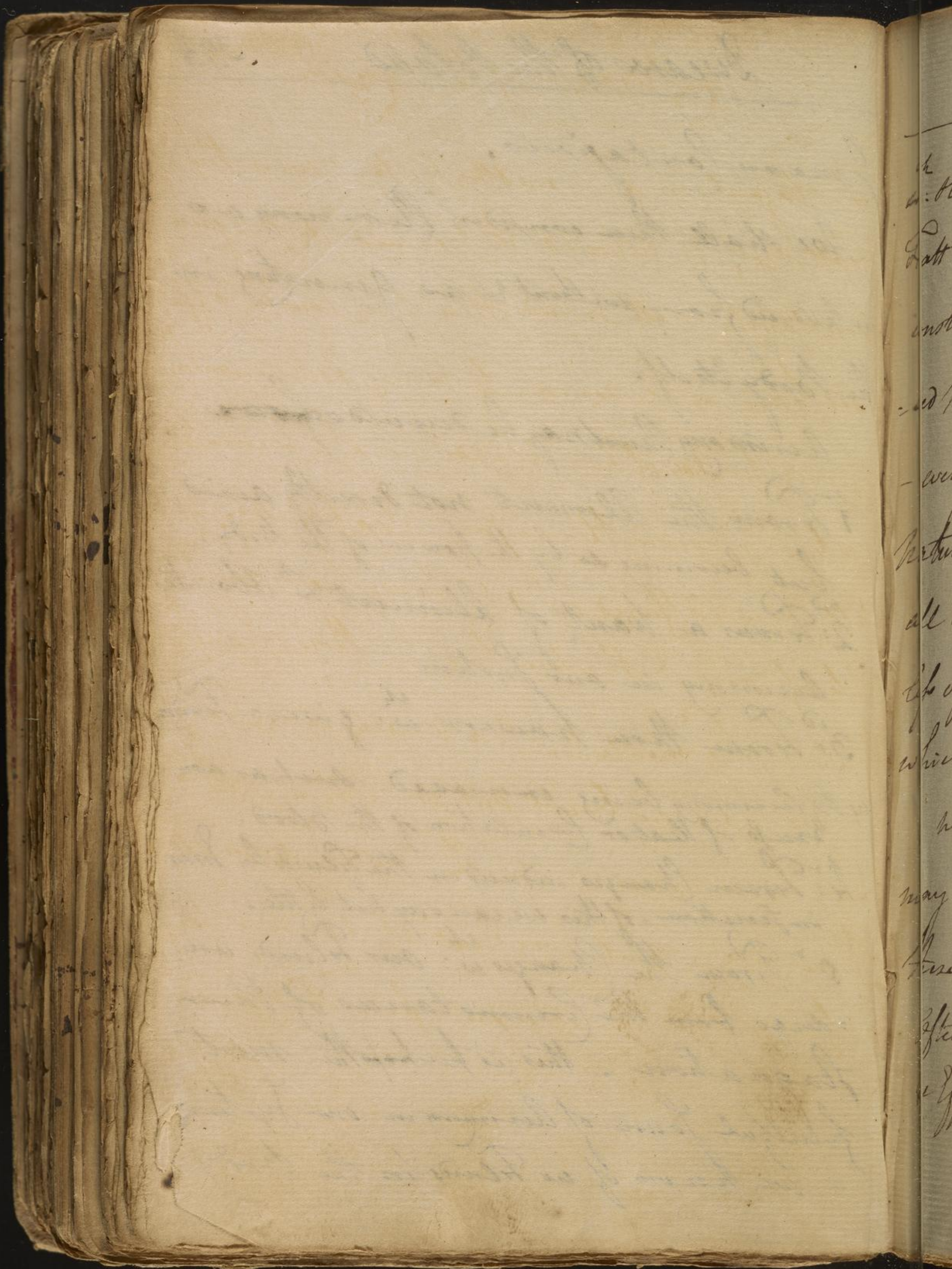
2nd From a want of Aliment w^{ch} Abolishes Acrimony in our System.

3rd From those powers w^{ch} give a Tension.

4th to Acrimony being increased such as an Excess of Heat, or Circulation of the Blood.

4th From Changes induced in the Fluids by Mors in Fermentation. of this we can say but little.

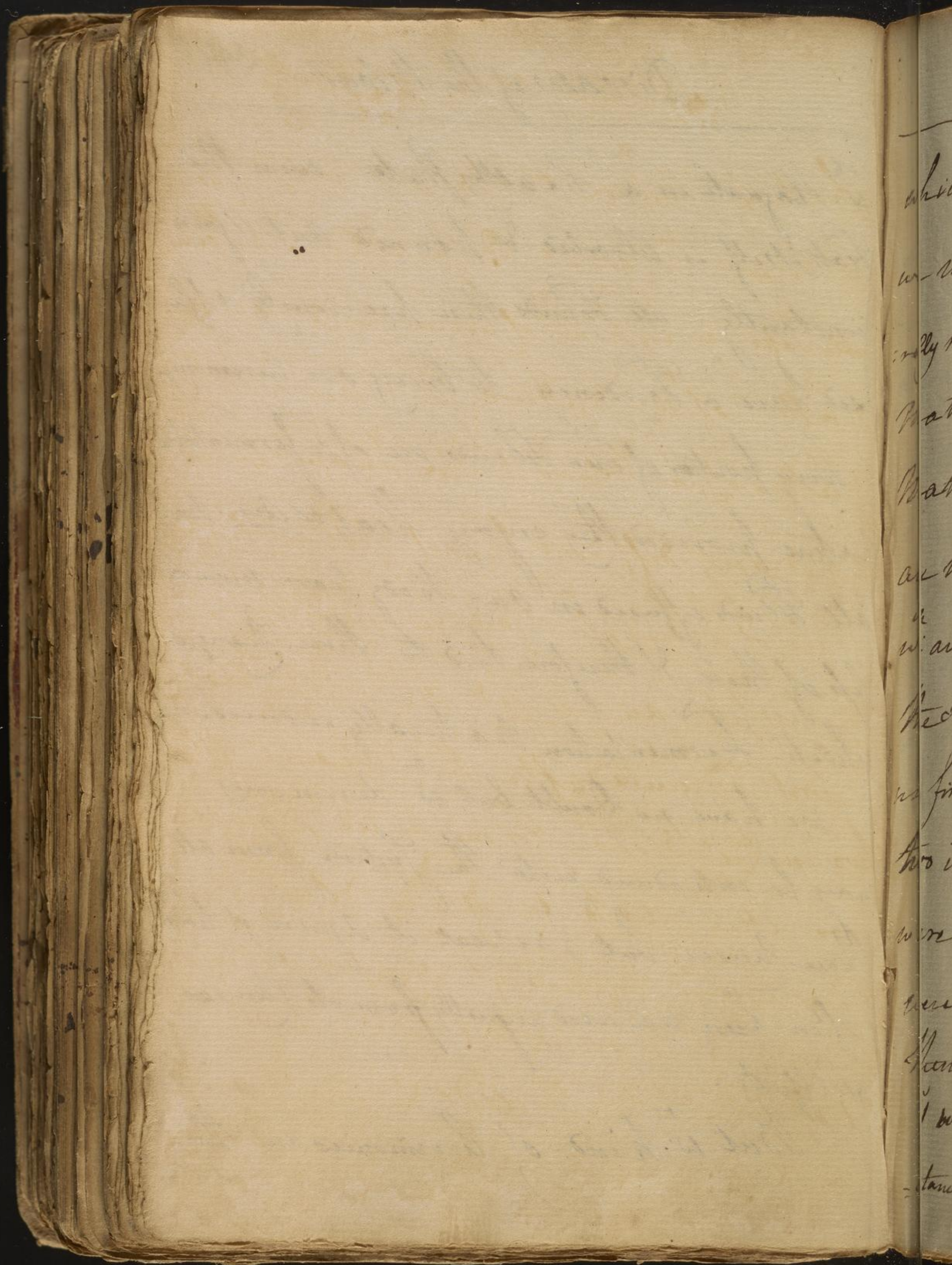
5th From the Changes w^{ch} our Fluids undergo from the Circumstances of their Stagnation. This is perhaps the most fruitful Source of Acrimony in our System - we know of no Fluids in the Body



^{ch} w. stagnate in a healthy state. even the
Heat itself is absorbed & poured out again
constantly. all Fluids then previously effu-
sed have a Tendency to bring on Curimony.
every portion of our Fluids are of a fermentable
nature provided they enjoy Heat & Air. Now
all Fluids effused in our Body have more or
less of these, & therefore tend to those Changes
which Fermentation naturally induces.

we have no Doubt but w² Curimony
may be introduced into the System from all
these Causes, but I repeat it again it has
often been accused unjustly from its Causes
& Effects.

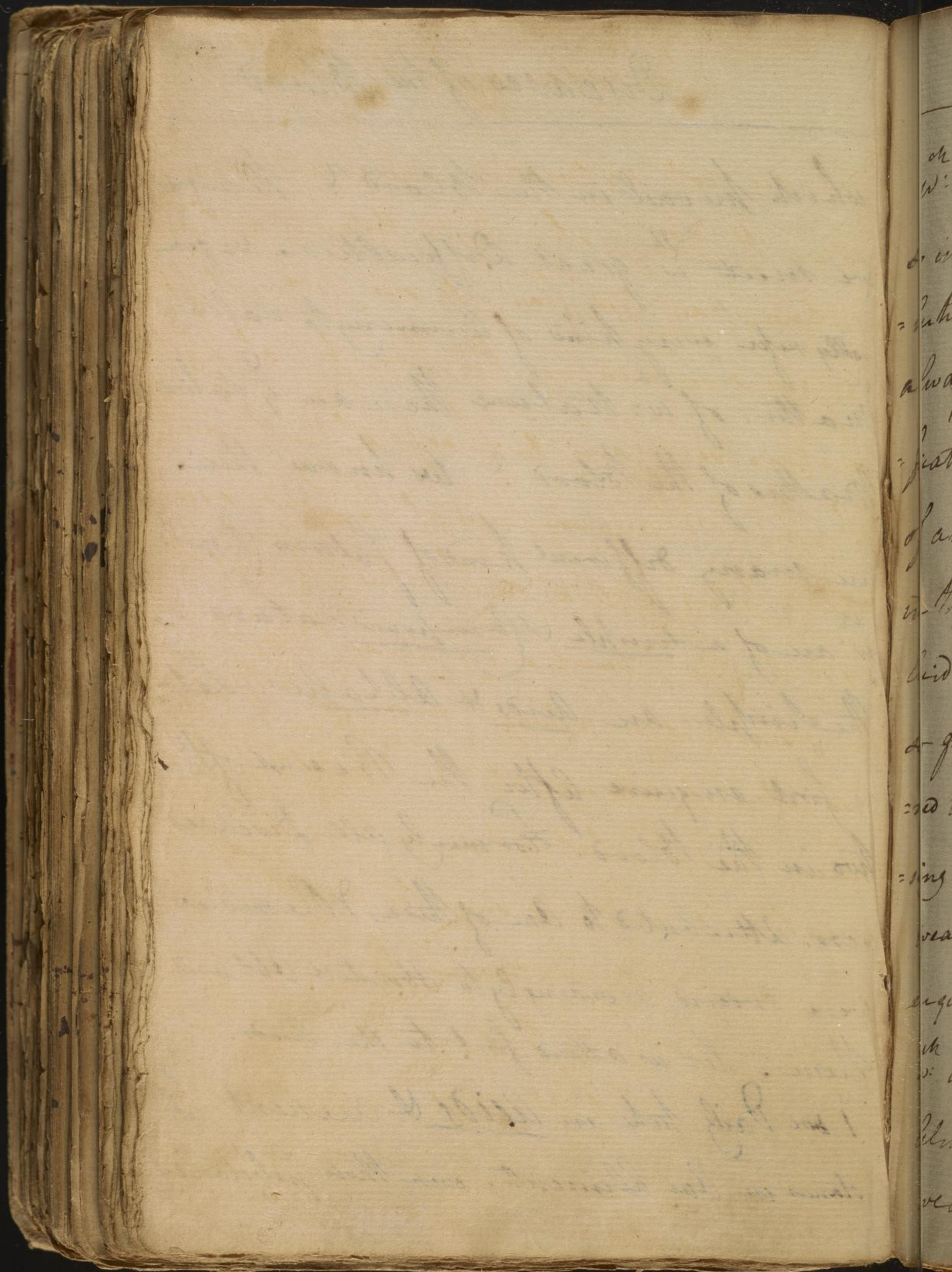
But wth kind of Curimonies are they



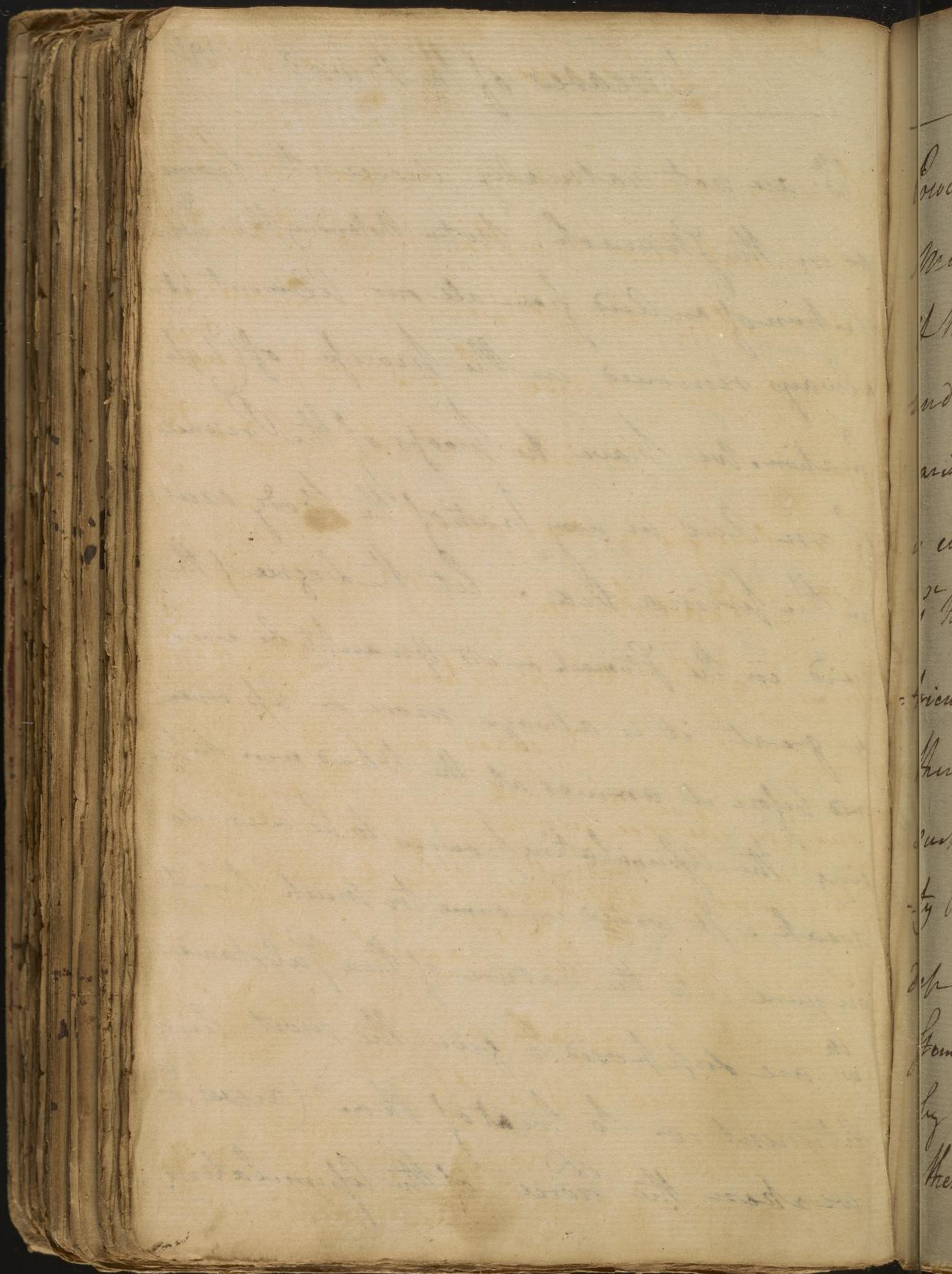
Diseases of the Blood ³⁹⁵

which prevail in the Blood? Here again
we meet wth great Difficulties. We gene-
rally refer every kind of Humour to saline
matter. of w^h nature there are 2 saline
Matters of the Blood? we know there
are many different kinds of Salts in Chemis-
try. w^h are of a simple & Compound nature.
The simple are acids & alkalis. Let
us first enquire after the Presence of these
two in the Blood. Formerly all Diseases
were attributed to one of these, & Remedies
were ordered accordingly to Obviate & Obviate
them. let us attend first to the acids.

I we Daily take in acids & acrid sub-
stances in our Aliment. even those substances



^{or} w: are not naturally acescent become
so in the stomach. Notwithstanding this too:
- lution of an acid from all our Aliment it is
always removed in the process of Chylifi-
- cation. We have no proofs of the Presence
of an Acid in any parts of the Body except
in the primo via: Let the Degree of the
acid in the stomach or its quantity be ever
so great, it is always more or less cover-
- ed before it arrives at the blood even suppos-
- ing the Assimilating powers to be ever so
weak. It would consume too much time to
enquire into the nature of those substances
th w: are supposed to give the most acid.
Aliment, or to treat of those Causes w:
weaken the Force of the Assimilating



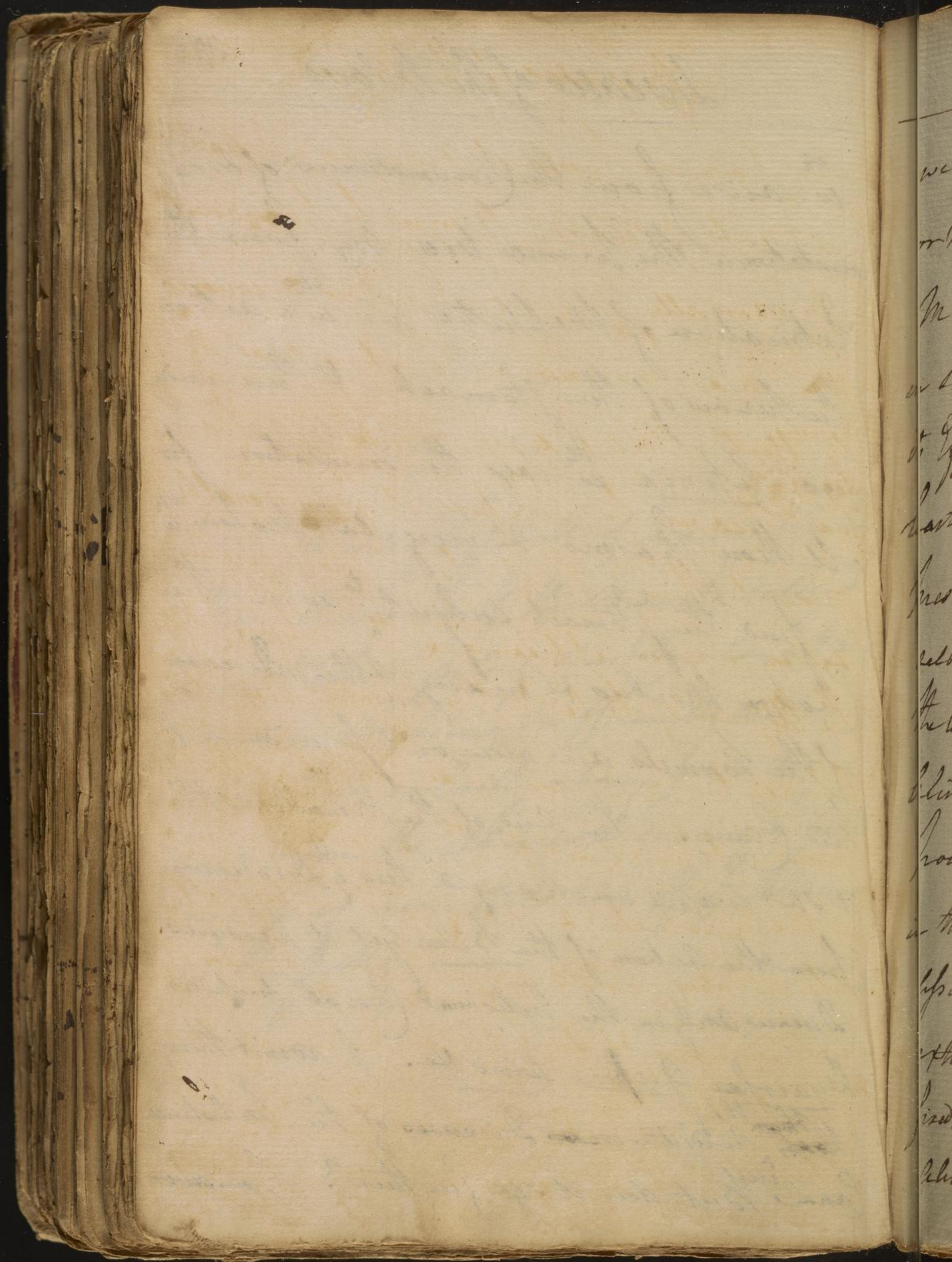
Poisons. But w^h shall we say to the Mineral Acids? - they act as Poisons, & therefore do not come immediately under our notice here. w^h Diseases arise from the Acid in the Primæ viæ B^{ch} is evolved from our Aliment? They are 1st the Heart Burn. 2nd the Morbus Ventriculi 3rd Pica & sometimes Bulimia. There are Other Diseases arising from it, such as the Feelings w^h are peculiar to Gouty Persons. all these Affections do certainly depend upon the Presence of an Acid in the Stomach & are greatly influenced in their violence by the Degree & Quantity of this Acid. But there Other more considerable Affections

121 "It may be ^a subject of Inquiry whether
these Disorders of the Bowels depend
upon the Acid acting simply upon ^{the} Bowels,
or upon its ^{not} being sufficiently neutralised
by the Bile, or partly upon fixed Air vol-
-ved from the Aliment during ^{the} further
progress of Fermentation of ^{the} Aliment
in the Guts" —

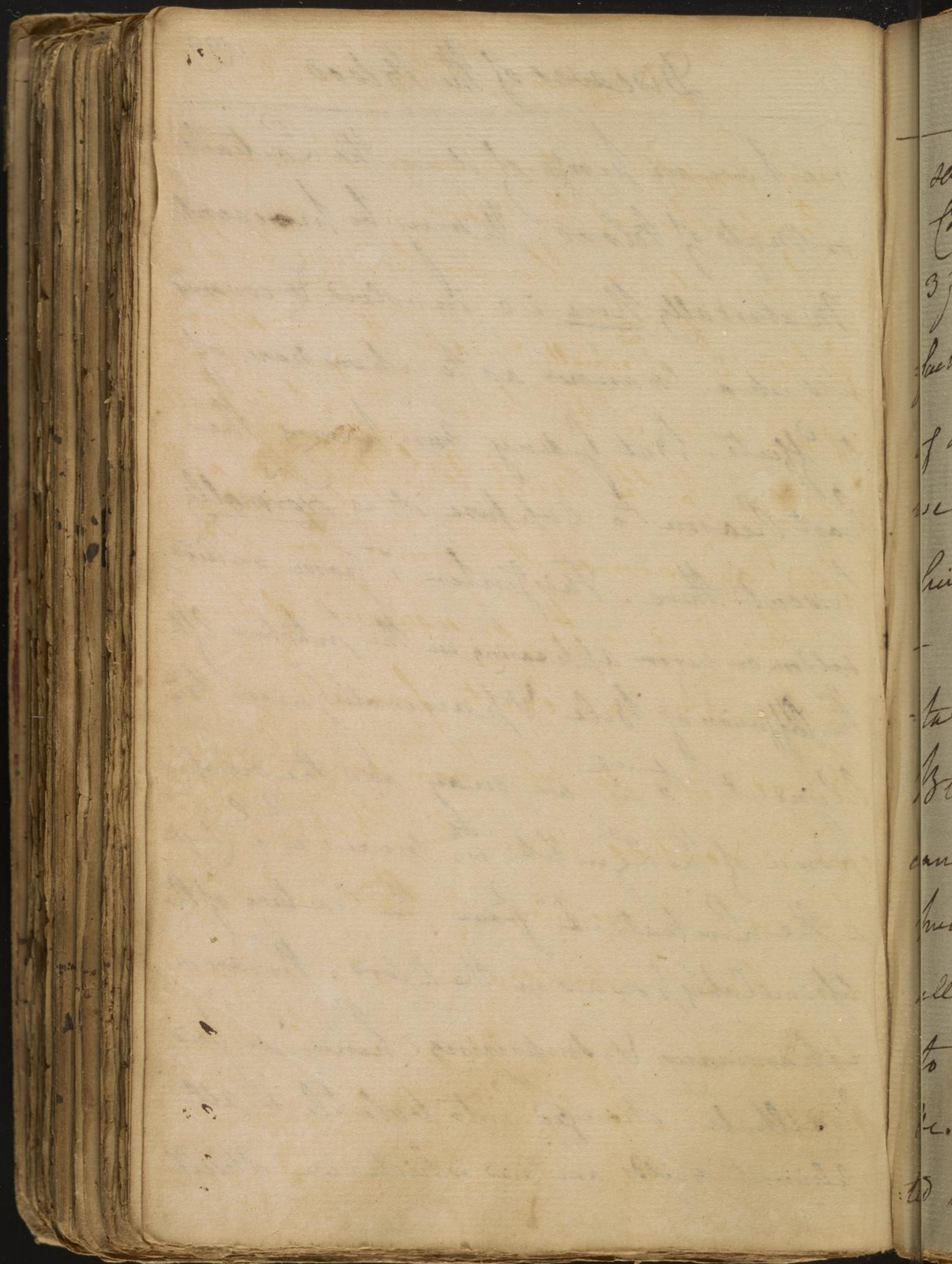
Diseases of the Blood

398

th w: arise from the Circumstances of Fer-
mentation in the prime via viz: from the
Extrication of Mephitic Air th w: act on
the Nerves of the Stomach, & thus induce
as Atonia th w: lay the Foundation for
all those Spasms & irregular Motions th w:
we find the Stomach subject ^{to} even the
Cholera Morbus & many other Diseases
of the Bowels are more or less induced by
this Cause. The Acid of the Stomach altho'
it sh^d escape unchanged thro' the Duodenum
from the Action of the Bile, yet it produces
Diseases only in the Intestinal Canal such as
Dysarrhea Græca - Wind &c. I admit then
~~that~~ ^{tho'} the Acid is ~~in~~ ^{the} Diseases of the Intestinal
Canal. But does it go further? - I answer



we have no proofs of it in the Lactals
or Mass of Blood! It may be present
materially there i.e. involved & covered
in such a manner as to show none of
its Effects, But I deny our having the
least Reason to suppose it is Formally
present there. This I infer ^{or} from enquiry:
seldom or never appearing in the intestines after
the Effusion of Bile & pancreatic Juice to
Aliment, ^{to ch} to w: we may add the diluting
power of the Lymph ^{ch} w: mixes w: ^{the} Chyle
in the Lactals. nd from the Nature of the
assimilating powers in the Blood. There are very
extraordinary & surprising. hence we find
fixed Alkali changed into volatile, & all
Aliment yields an Acid which we shall



Diseases of the Blood 400

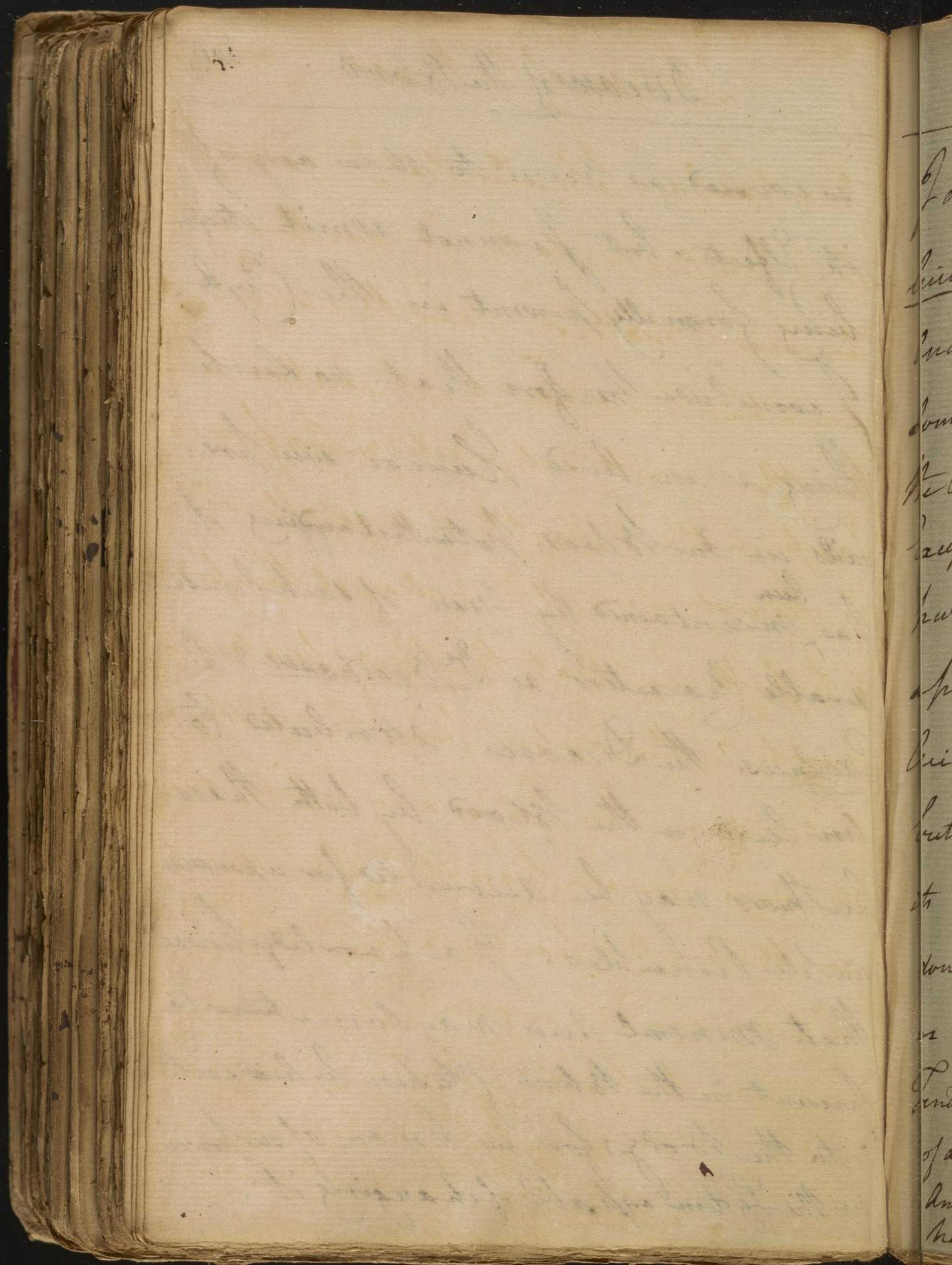
say hereafter enters more or less into the
composition of the Blood.

3 from all our Humors tending to Putre-
faction ^{ch} w: effectually abridges the consequence
of an Acid in the Blood. But w: shall
we say to the Milk which yields an
Acid as soon as it comes from ^{the} Breast?
— This Acid is the consequence of Fermenta-
tion. It never exists formally in the
Blood, nor do we know any thing ^{of} it
can decompose it in the Body. Besides
previous to its evolving its Acid it requires
all those circumstances ^{ch} w: are necessary
to Fermentation, such as Heat &c.
Even supposing that it nearly exists
in the Chyle formally, yet it is always

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so covered as never to show any of
its Effects. but I cannot admit it ever
being formally present in the Cycle.
I conclude therefore that no such
thing as an Acid Humor ever pre-
vails in our Blood notwithstanding it
has ^{been} maintained by Men of such Consi-
derable Characters as De Boerhaave & D. J.
Gaubius. The Diseases attributed to
an Acid in the Blood by both these
Authors may be accounted for upon more
simple Principles. I acknowledge however
that Mineral Acids may sometimes be
present in the Blood if taken by Acid eat
into the Body, for we know of no power
in the System capable of changing it.

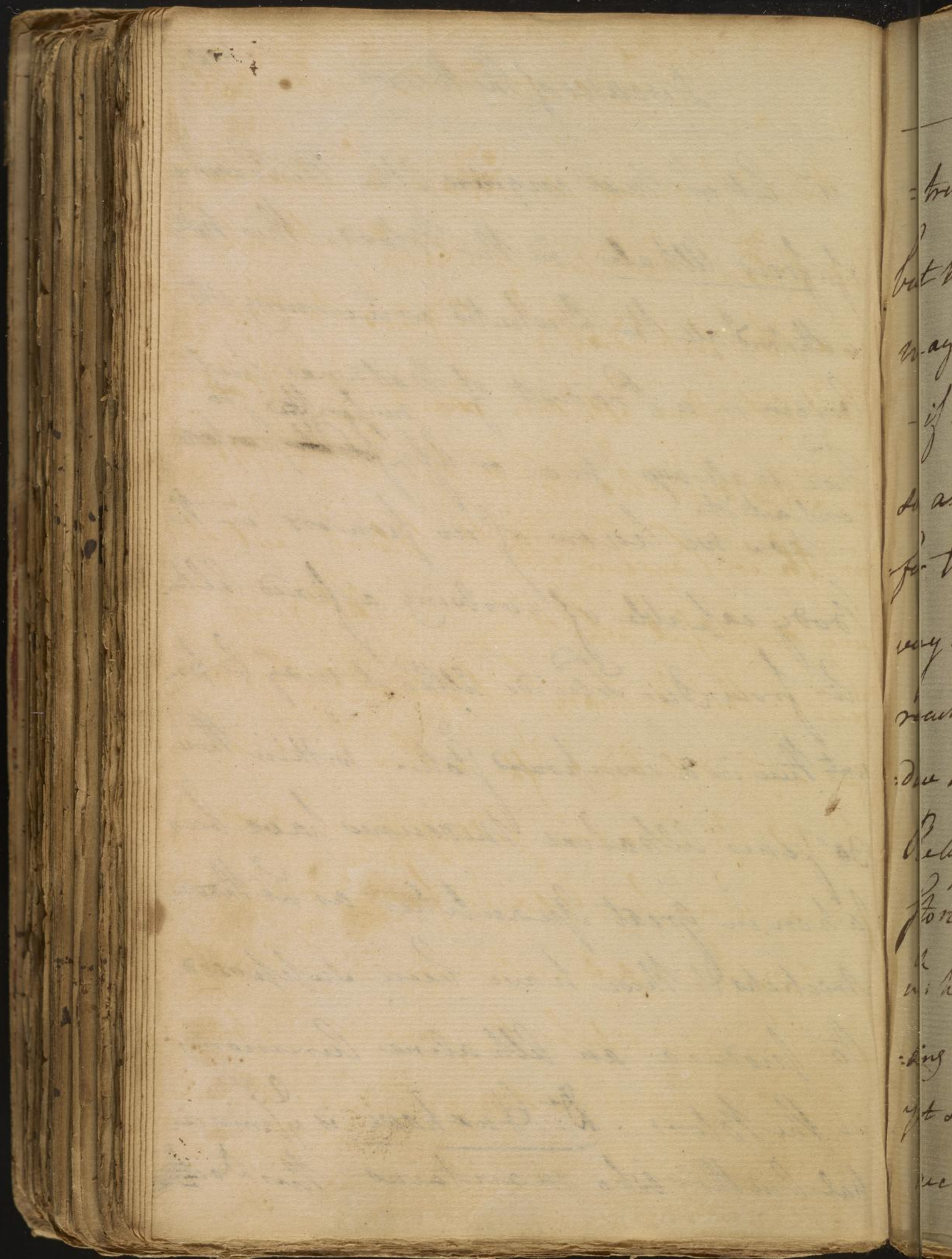


I acknowledge likewise that Vegetable
Acid enters into the Composition of
Animal Matters. Now this Acid may
sometimes be in an Over proportion to
the other matters it unites with, from an
excess in the Quantity of vegetable or
putrescent Aliment. I allow it therefore
a possible case that there may be a morbid
Acidity in the System from this cause,
but I deny our having any proofs of
its being formally present in it. I even
doubt whether particular Aliment such
as Animal or vegetable have any
Tendency to produce an Over proportion
of acid Acid, or any Decomposition of the
Animal Solids. Notwithstanding so much
has been wrote & said upon this subject.

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11. Let us next enquire after the Presence
of fixed Alkali in the Blood. This has
withstood all the Disputes concerning its
Origin is a Product of Nature but
Fire is always more or less ^{necessary} ~~to~~ ^{to} ~~extract it.~~
- now we know of no powers in the
Body capable of evolving a fixed Alkali
- from our Liquids altho it may be pre-
sent there in a compound state. within these
30 years Alkaline Medicines have been
taken in great Quantities as Lithon-
-Arcticks & these have been supposed
to produce an alkaline Curimony
in the Blood. Dr. Gusham is princi-
-pal Author who maintains this Doctr



404

Diseases of the Blood.

= true. I grant it is hard to refuse Facts
but when they are solitary I think we
may be sceptical w: th regard to them.

- if alkaline salts ever reach the bladder
so as to dissolve stones then, we might in-
fer their presence in the blood, but it is

very doubtful whether these salts ever
reach the urinary passages so as to pro-
duce any dissolving effects there. the same

Relief w: alkaline salts give in Cases of
stone may be obtained from medicines

th w: have no dissolving powers. Even suppo-
sing they did dissolve the stone in y^e bladder
yet still I would rather suppose they were

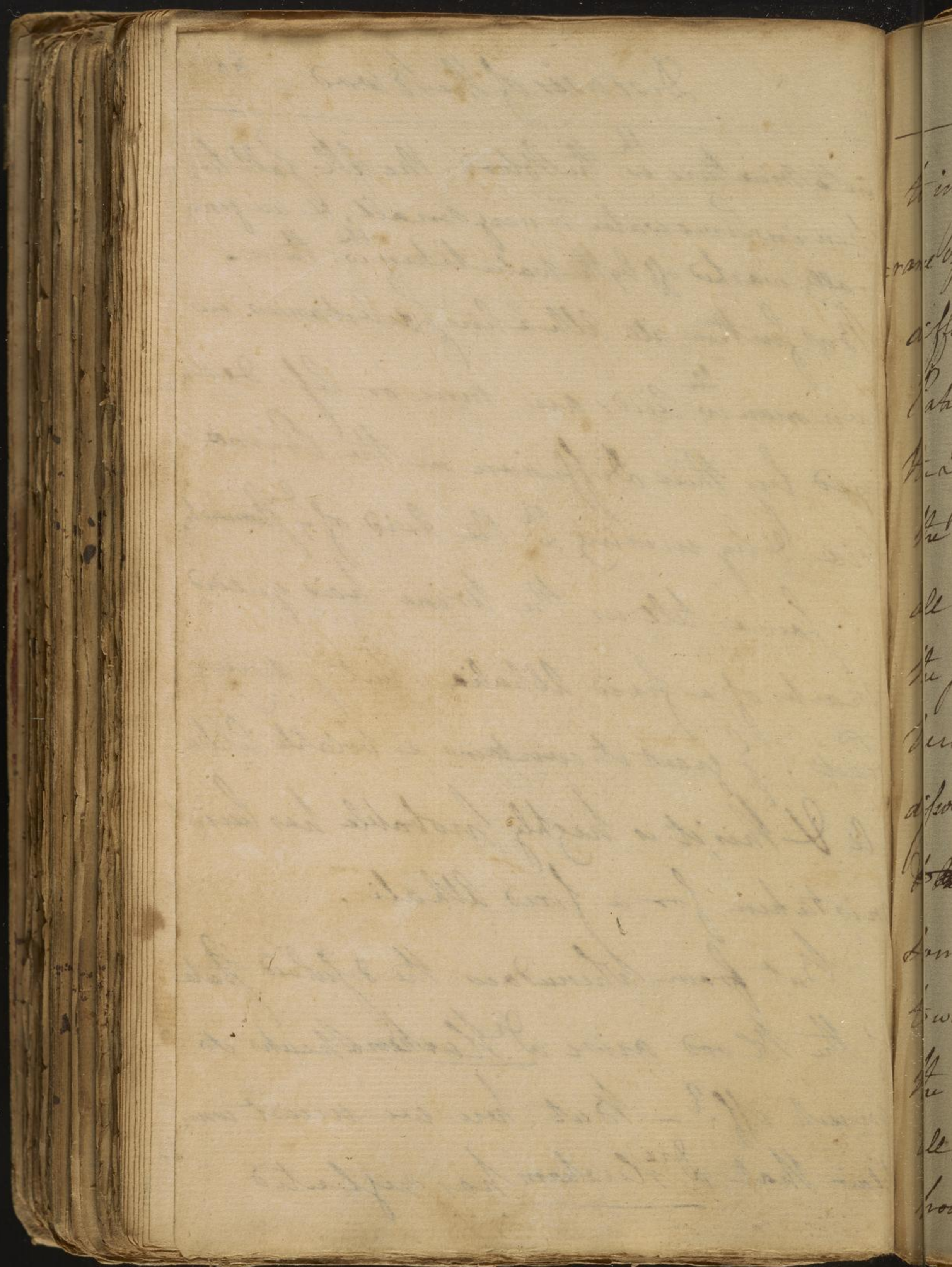
accumulated in the bladder, & did not enter

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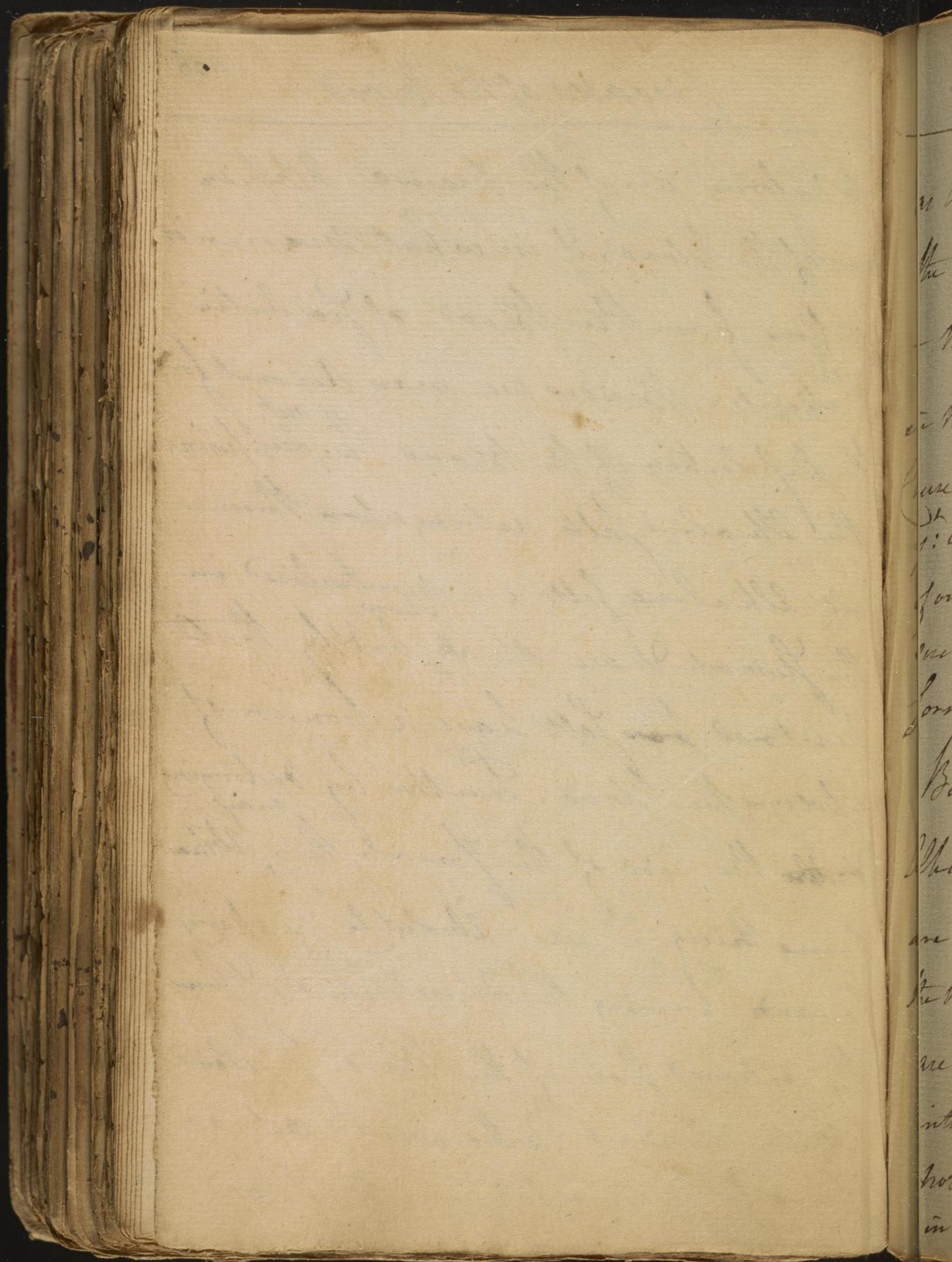
into mixture w: the Blood. The All: salt then
-pen in Lime water is very small, & are fine-
rally washed off by the water taken w: them.

But further all Alkaline Substances in
common wth Acids are more or less destr^o
-yed by their Diffusion in the Primo
Vie, & by mixing wth the Acid of ^{the} Stomach.
-some tell us the Urine has yielded
marks of a fixed Alkali, but I deny ^{it}
Deed. I grant it contains a volatile Alka-
li & this, it is highly probable has been
mistaken for a fixed Alkali.

But from whence does the defiled state
of the Blood arise Dr Rusham speaks so
much off? — But here we must com-
plain that Dr Rusham has neglected



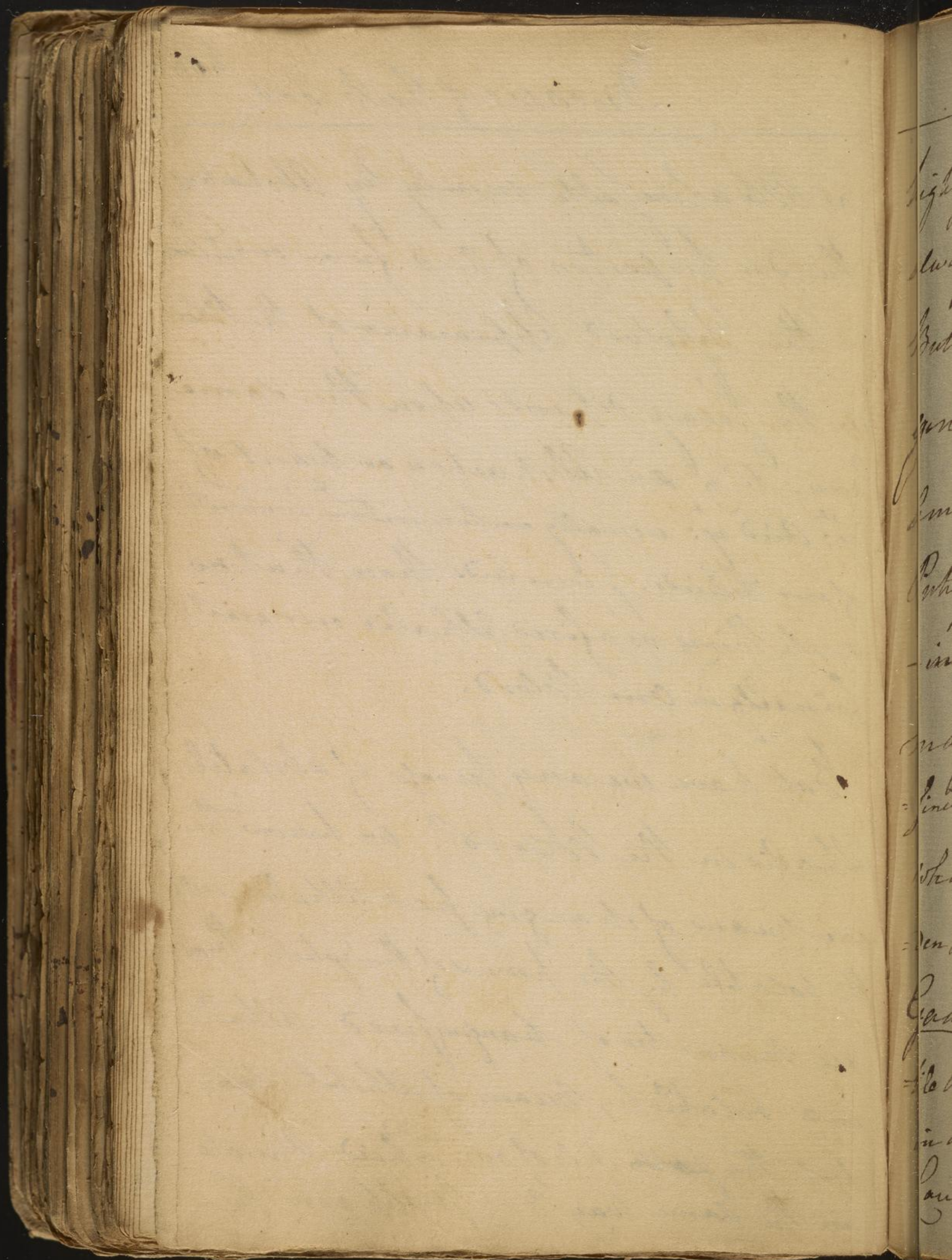
to inform us of the precise Appear-
ance of the Blood, & in what manner it
differs from the Blood of Scorbutic
Patients. Besides we may Account for
the Disolution of the Blood wth ^{the out} Supposing
the Alkaline salts acting upon them.
all Alkaline salts are neutralised in
the Stomach & we shall ^{show} by & by that
Neutral ~~for~~ salts have a power of
dissolving the Blood. Further by destroying
~~the~~ the Acid of the Stomach they ^{may} Abstract
something w^{ch} was absolutely necessary
towards forming the Animal Fluids, & thence
the dissolved state of the Blood. I believe
all the Absorbent Vessels would act as
powerfully in dissolving the Blood



Diseases of the Blood 407

as Alkaline salts merely by Abstracting
the due proportion of Acid from our Fluids.
— the dissolved Appearance of the Blood
in the serum depends upon the same
Cause viz an Abstraction or want of
Acid ^{it} usually enters into ^{the} composition
of our Fluids. I conclude then that no
such thing as a fixed Alkalie ever exists
formally in our Blood.

But have we any proofs of a volatile
Alkalie in the Blood? we know there
are means of changing fixed Alkalies into
the volatile by the powers of the System. There
are means too of changing fixed Alkalie
into volatile by means of Alcohol. May I
not the ~~same~~ Oils of our Fluids Operate
in the same way? — It appears then



highly probable that volatile Alkali is
always present in Animal Fluids? -
But is ~~now~~ ^{it ever} in a separate state? we
generally find it in the form of an
humoral salt. But may not
Putrefaction evolve it? - This is doubtful.
- in Cases of Gangrene a volatile Alkali
may be evolved, but it is always con-
fined to one space only; for, ^{as} soon as $\frac{1}{2}$
whole mass of Fluid is affected wth it, sud-
den Death is immediately bro't on. Dr.
Gardner supposes in § 310 that a vola-
tile Alkali may be present in $\frac{1}{2}$ Blood
in a separate state, & mentions $\frac{1}{2}$ several
causes w^{ch} introduce it there. The 1st is the

121 and the filagosa of Ray.

61 For an Au. of the Spiritus Rector see
Gr Bonhaves' Chemistry.

Diseases of the Blood.

409

use of vegetables abounding ⁱⁿ ~~in~~ ^{the} vol. ~~in~~ ⁱⁿ Alkalie
such as y ² Tetradynamia of Linnaeus. But

I doubt whether these vegetables contain

a volatile Alkali in an uncombined

state, but if they do it is in very small

quantities, hence we find their whole Boon

or Spiritus Rector ¹⁶⁴ ~~dis~~ ^{ing} ~~tributed~~ ^{them} by dry ~~ing~~ ^{ing} them.

- But supposing it present in large

quantities the Acid of the Stomach would

immediately destroy it, nor ~~it~~ ^{are these kind of} ~~with~~ ^{vegetables} ~~even~~

taken in the body in ^{1 sufficient} ~~of~~ Quantities

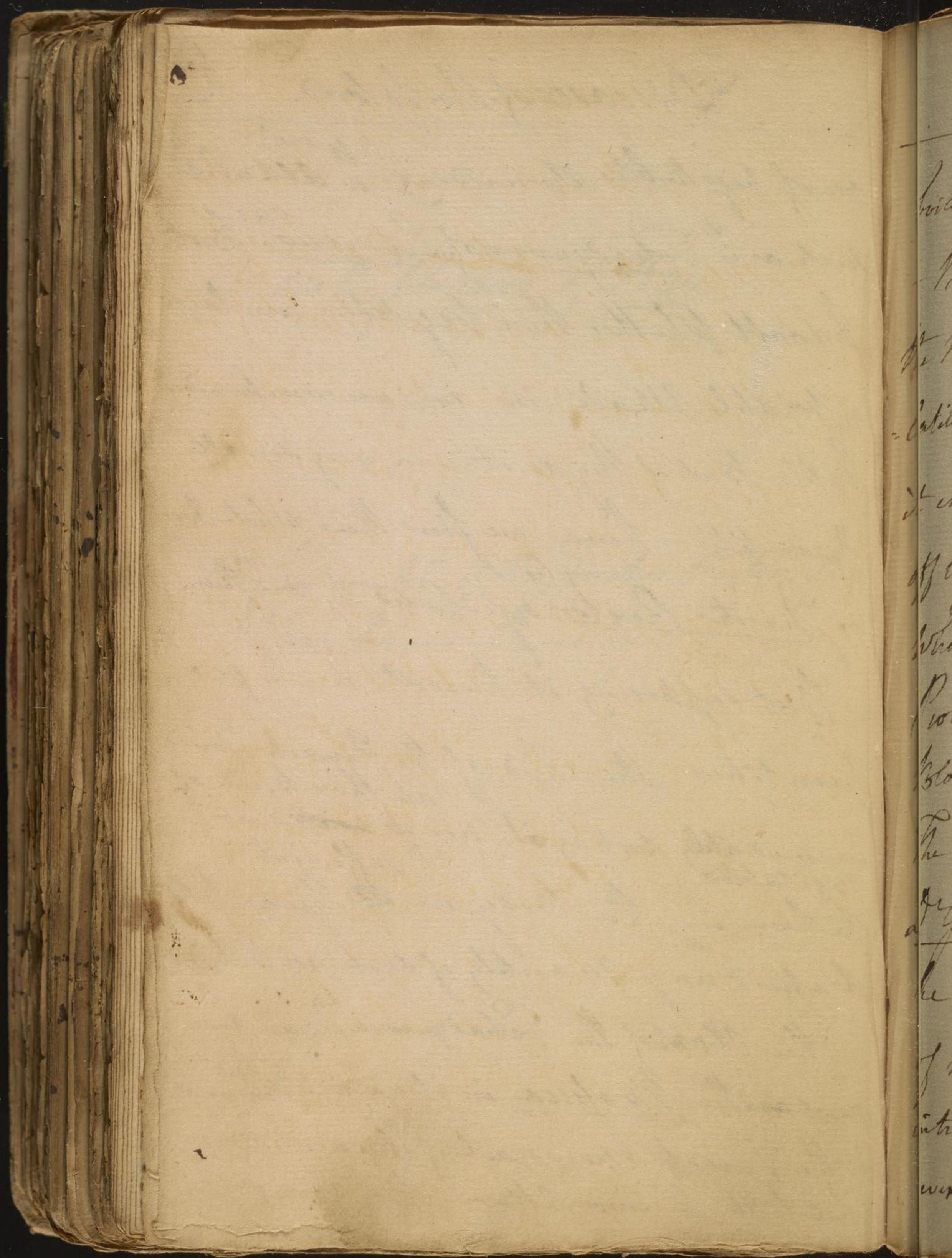
to afford any quantity of such an Alkali,

the Plants of the Tetradynamia ⁱⁿ we use

most are the Brassica in its various Forms

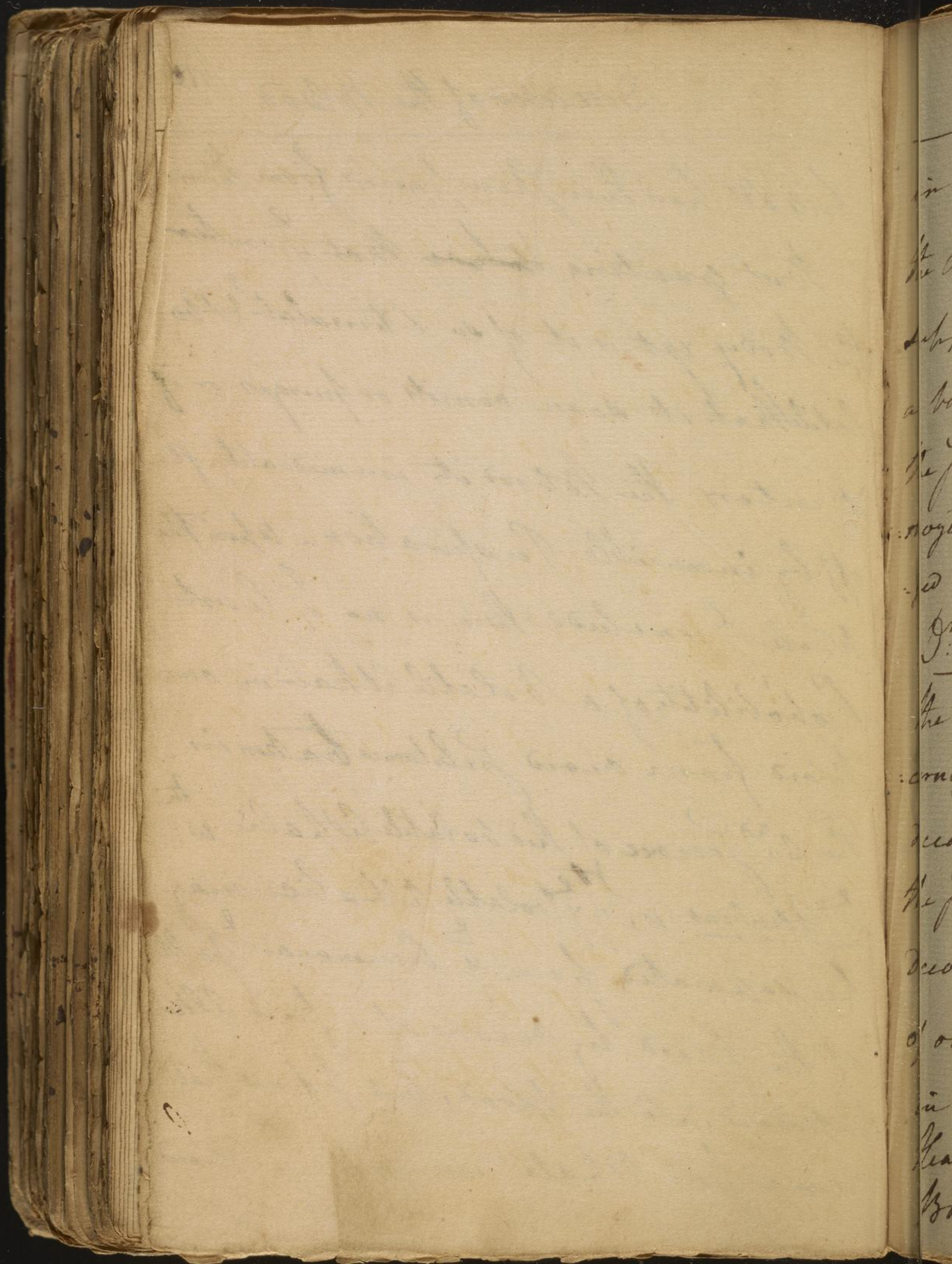
& the Turnep. Now each of these contain

but little Acimony, after they have been



Diseases of the Blood 410

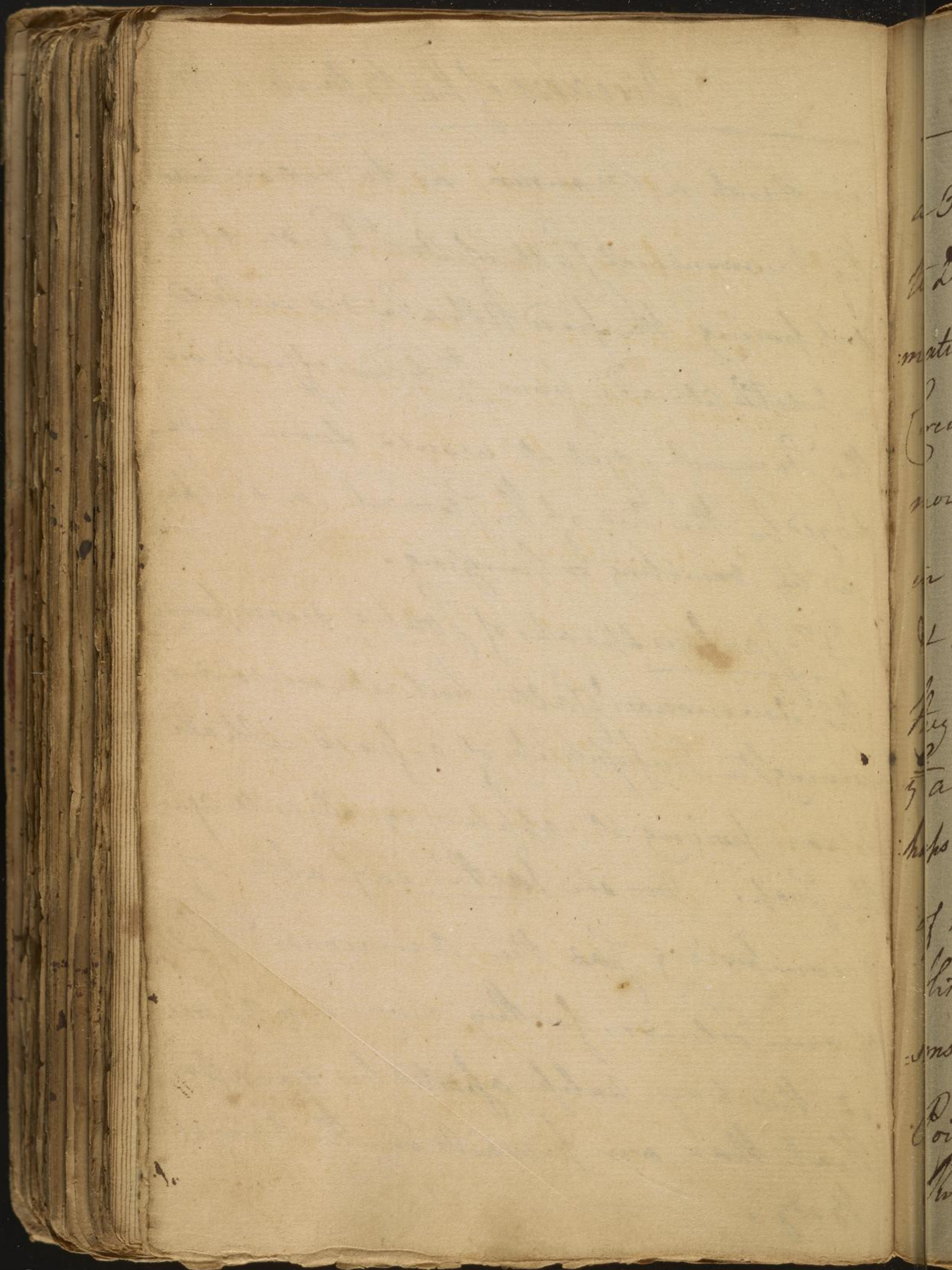
boiled & had their skin paired from them -
 - But granting ~~that~~ ^{that} y^e enter
 the body y^t is it of so Stimulat^g & bo:
 latil that it soon vomits or purges or if
 it enters the blood it immediately flows
 off by insensible Perspiration. Upon the
 whole I conclude there is no y^e least
 Probability of a volatile Alkali in our
 blood from acid substances taken in.
 The 2^d source of this volatile Alkali w:
 Dr Gernius is, y^t volatile Alkali may
 be separated from y^e Ammoniac^l salt
 of the blood by means of a fixed Alkali
 introduced into the blood, but I deny that
 w^h a fixed Alkali can enter y^e blood



Diseases of the Blood 411

in such a manner as to decompose the Ammoniacal Salt of our Fluids. even supposing the fixed Alkali did evolve a volatile Alkali from $\frac{2}{3}$ Fluids effused in the Stomach, yet it would soon be destroyed by the Acid of the Stomach, or discharged by vomiting or purging.

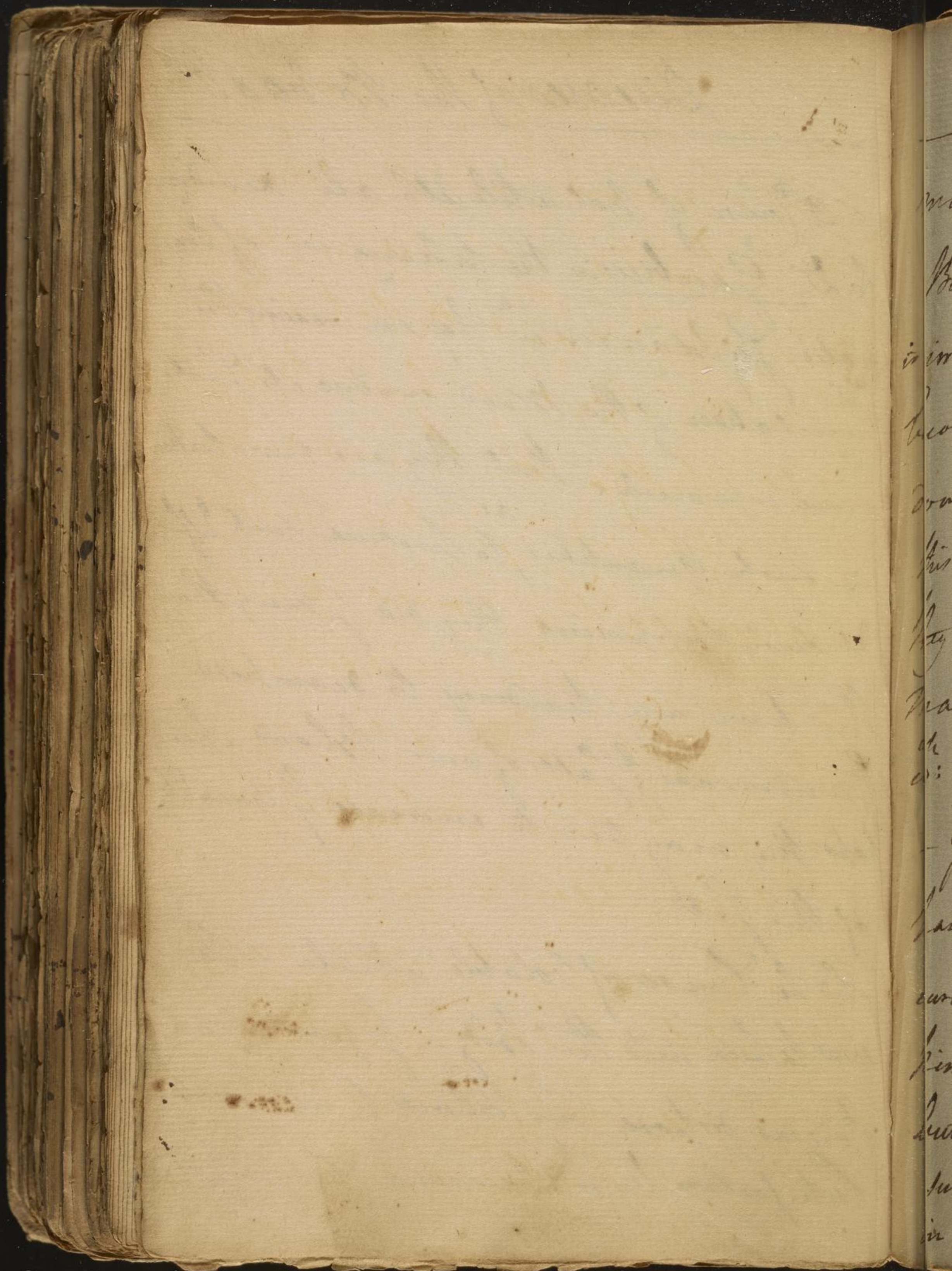
Dr. Gaubius speaks of Soaps decomposing the Ammoniacal Salt, but all we said concerning the Impossibility of a fixed Alkali decomposing it applies equally well against the Soap. Nor are Earths capable of decomposing ~~for~~ the Ammoniacal Salt of our Fluids, for they never can operate in this way unless assisted by greater Heat than ever prevails in the animal Body.



Diseases of the Blood. ⁴¹²

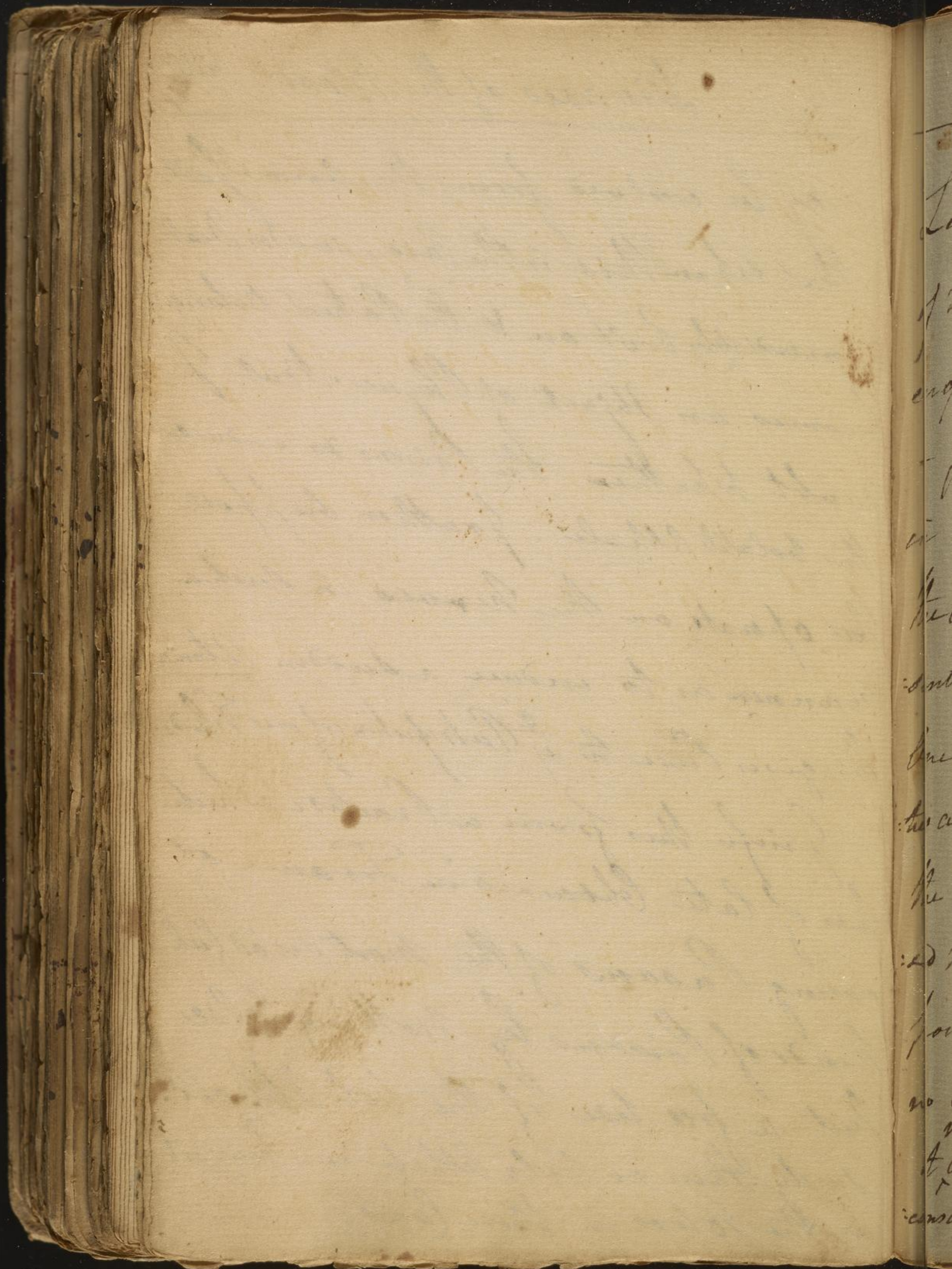
a 3rd Cause of volatile alkali according to Dr. Gambius is the taking in of arsenic substances w^{ch} by increasing the Circulation of the Blood evolves its Salts more copiously. But they are never taken in such Quantities, ^{as} to produce such Effects, It even supposing they did I deny that they have any tendency to decompose ~~the~~ ammoniacal Salt of our Blood, perhaps they may tend to increase the Quantity of this Salt.

His 2^d Cause of volatile alkali is Poisons taken into the Body. I grant some Poisons dispose our Fluids to immediate Putrefaction by w^{ch} means a volatile alkali

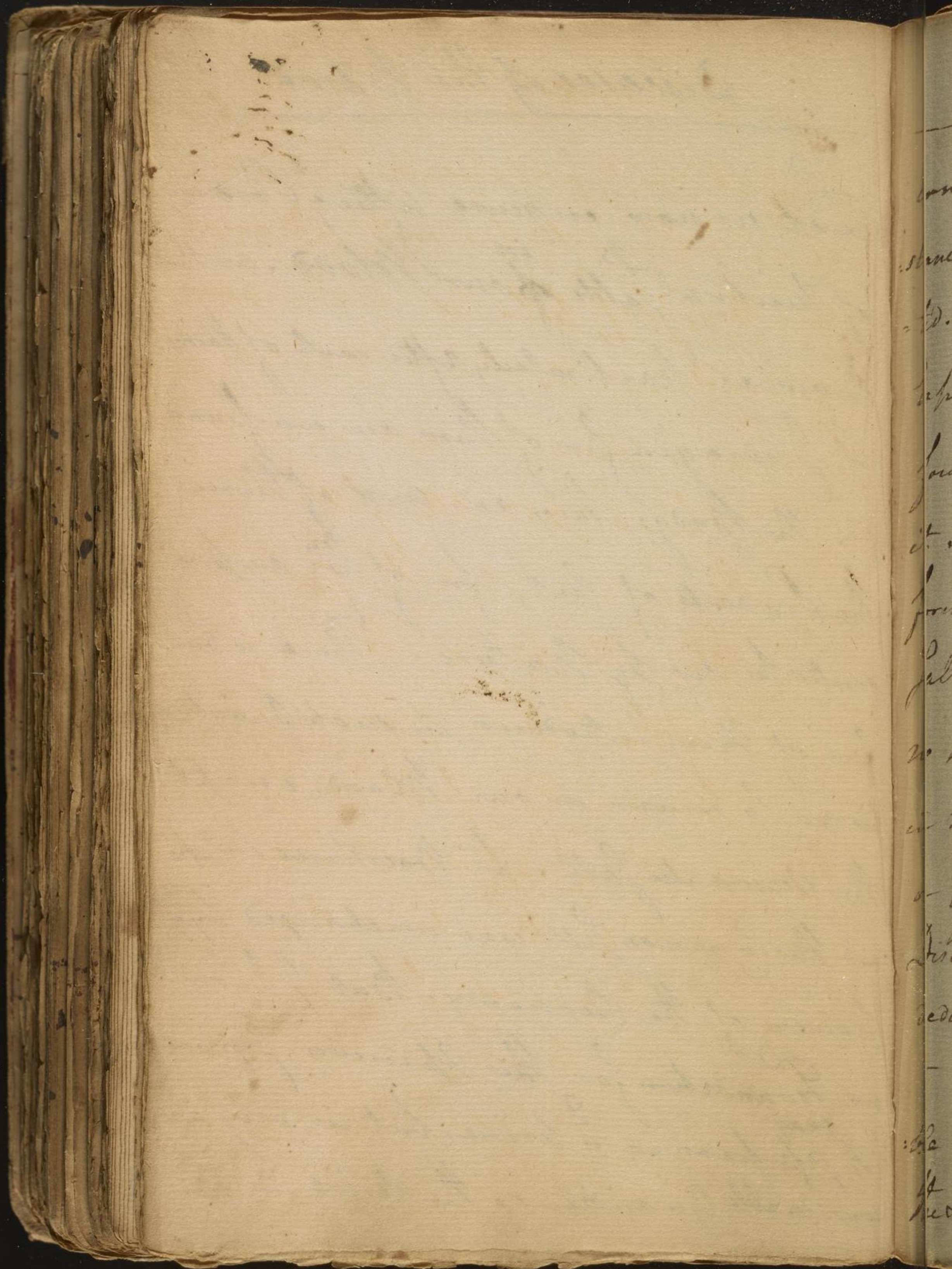


Diseases of the blood. 413

may be evolved from the animal Galts
But when this is the case, sudden Death
is immediately bro't on & the Patient no longer
becomes an Object of Physic. But I
doubt whether the Poisons do induce
this volatile alkali. I rather suppose
they operate on the Nerves in such a
manner as to induce a sudden Atonia
or give rise to a Putrefaction of our Fluids.
— I infer this from a Practice which
has of late obtained in France of
curing Poisons of the most dreadful
kind of Poisons by nothing else
but a free use of the vol. alkali.
surely then no vol. alkali can exist
in the blood in these cases.



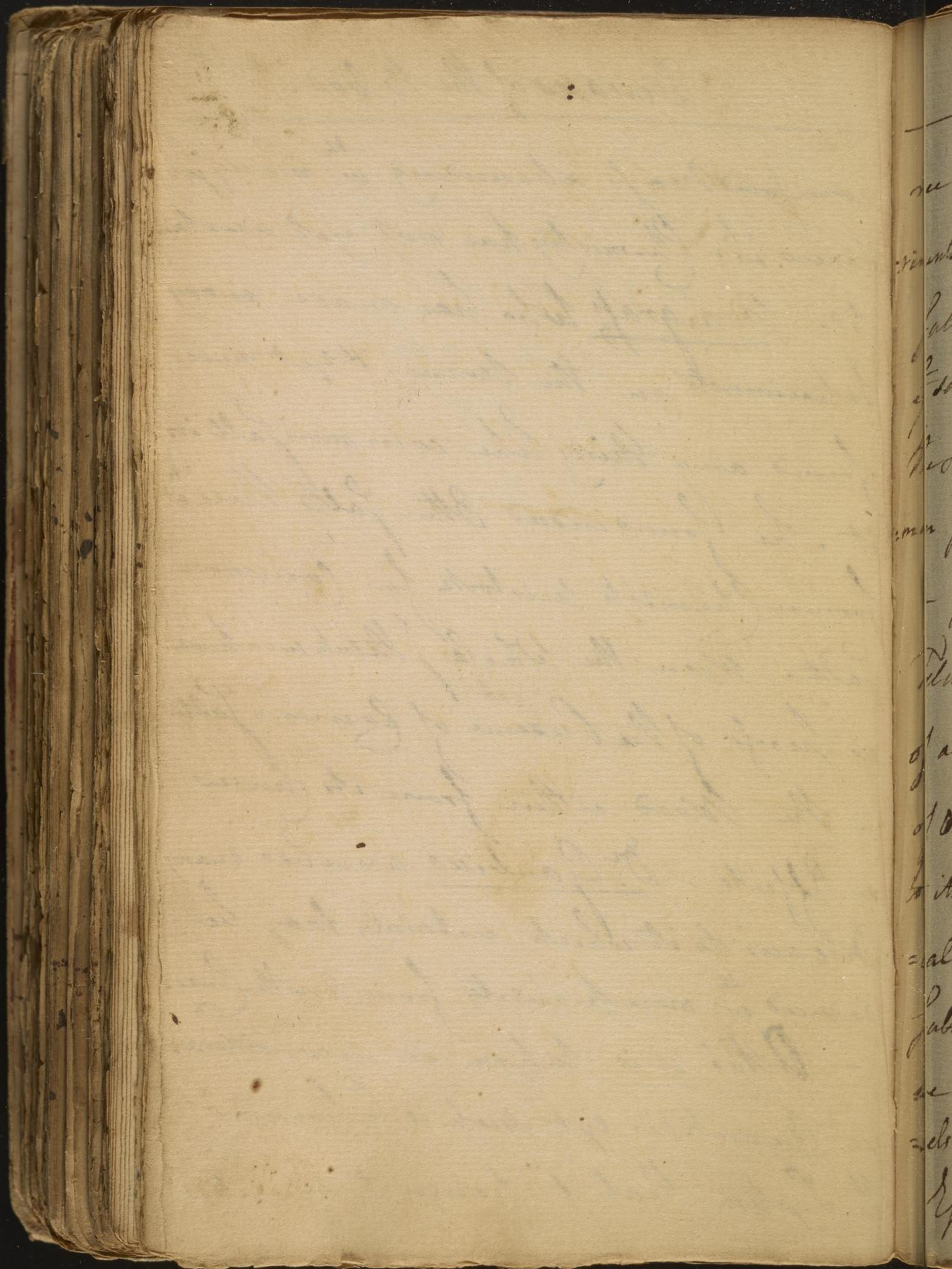
Let us now enquire after the Presence
of Neutral Salts ⁱⁿ our Blood. we shall
enquire particularly after each of them.
- I imagine few of them are ever found
in the Body. they are most of them
the Products of Art, few of ^{em} are pre-
sented to us by Nature. There is but
one of them introduced in such Quanti-
ties as to remain in our Blood, except
the muriatic salt. Dr. Boerhaave suppo-
sed this Common salt was unchanged by the
powers of the Economy. But I know
no Foundation for this Opinion. I grant
it ^{may} appear in y^e Urine, but in very in-
considerable Quantities. The Urine is a



Diseases of the Blood. 415

compound Mass abounding wth many substances w^{ch} Chemistry has not yet ascertained. Margraff who has made many experiments on the Urine, & yet never found any thing like common salt in it. He found indeed other salts there w^{ch} former Chemists mistook for common salt. Upon the whole I think we have no proofs of the Presence of common salt in the Blood either from its causes or Effects. Dr. Gaubius ascribes many Diseases to it which certainly may be deduced wth more propriety from another Cause.

— Altho' it is taken in inconsiderable Quantities yet such is y^e power of the Lymph that it changes it after it is



received B into the Body. Some late Experiments in France teach us γ . Muratic salt may be changed into Nitre. in the same manner I suppose the powers of the System are capable of changing common salt into ~~nitrous~~ ammoniacal salt.

- I say further there is no salt in our Fluids composed of a fixed Alkali, or of any of the four kinds. The salt then of our Fluids is of a nature peculiar to itself & appears to be of γ ammoniacal kind. This we prove from such a salt always appearing in the Urine ^{where} we are ^{sure} formerly flowed in the blood vessels of Animals. It has been called the Essential salt of Urine, but it maybe

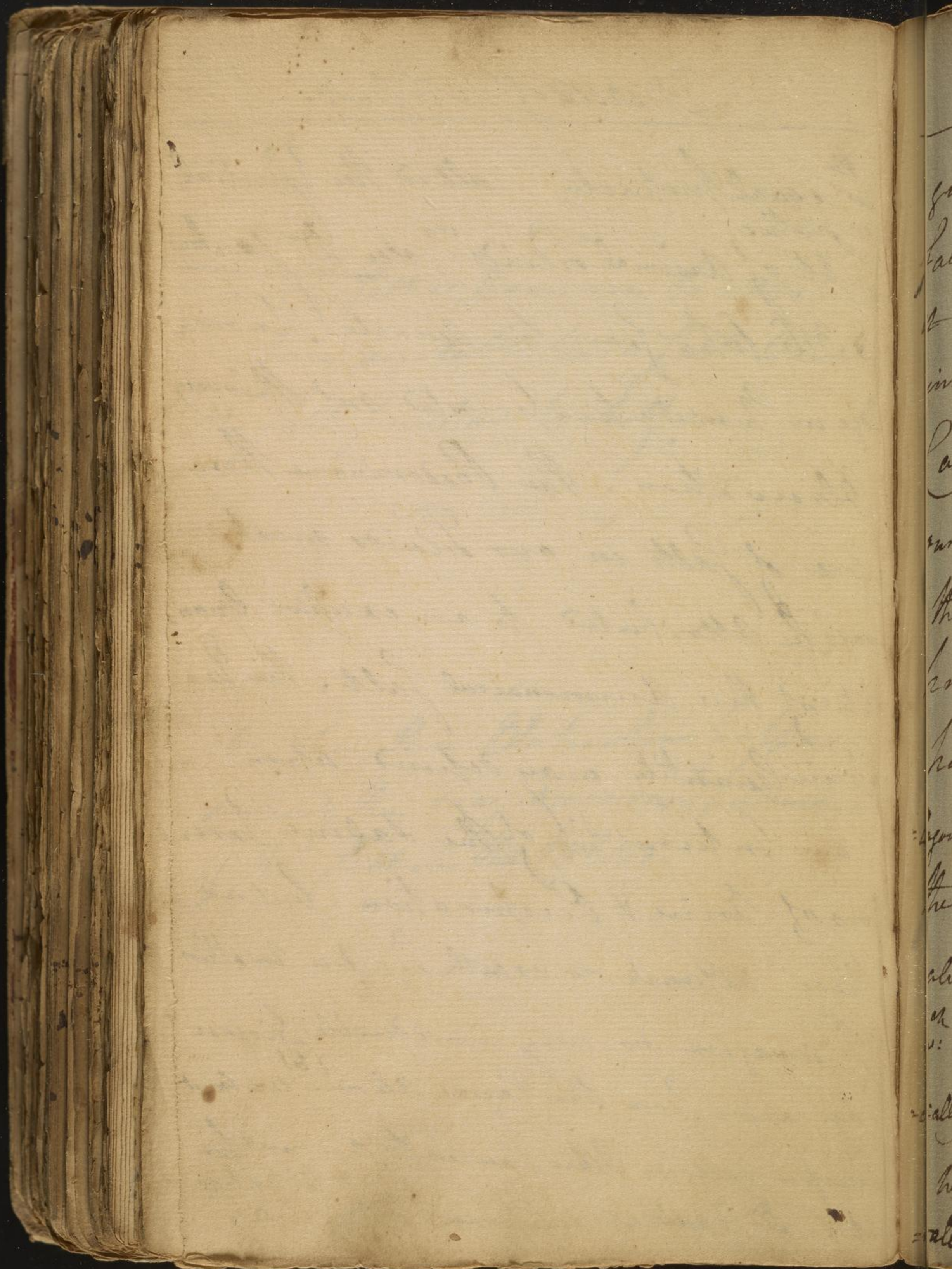
(14) This Salt is Common to all Animals.
Every Vegetable has a Salt likewise
a Salt peculiar to itself.

(16) When these Obstructions happen very
suddenly they may occasion ^{the} predominance
of this Salt in the Blood.

Diseases of the Fluids.

417

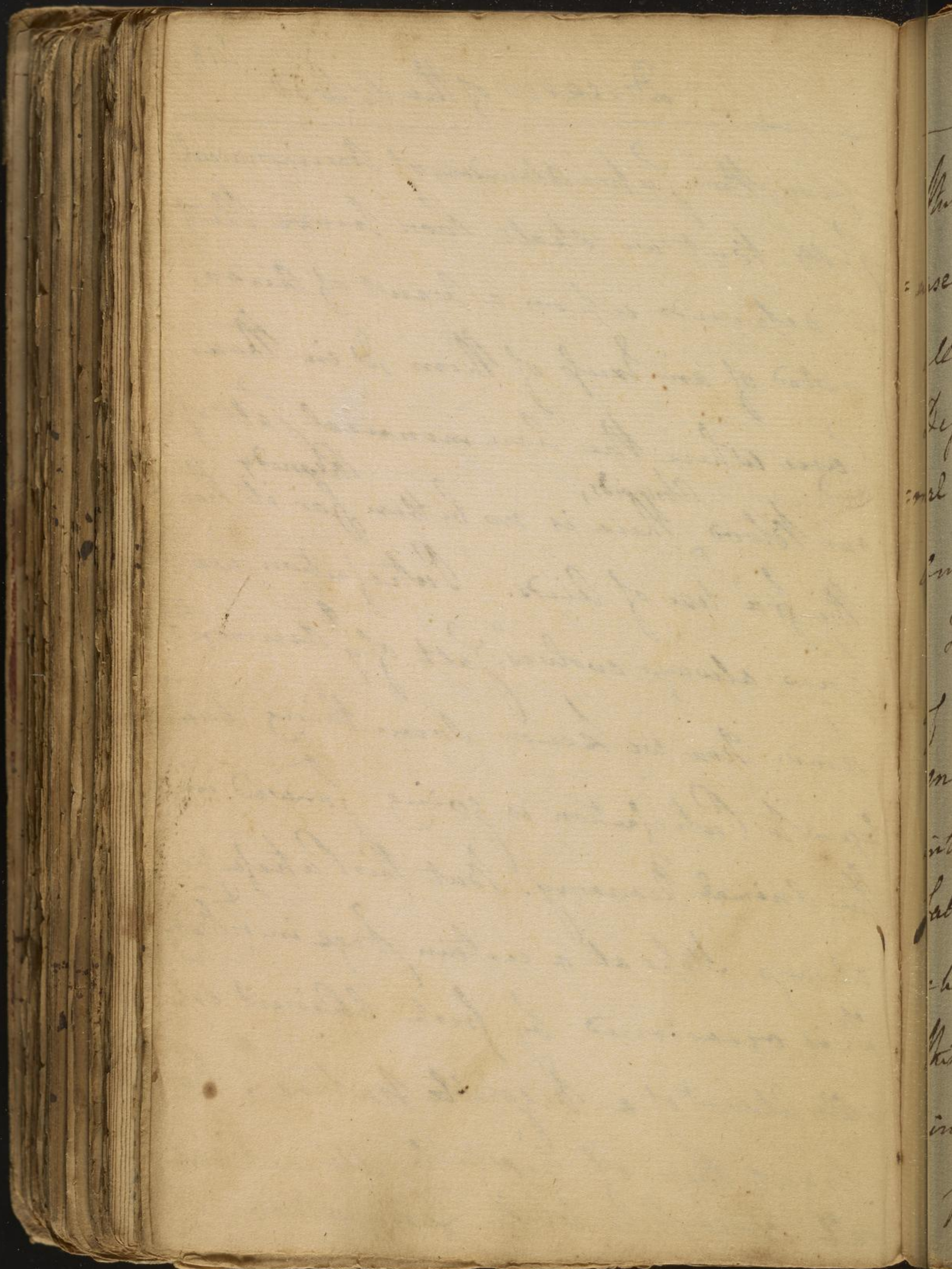
^{the} w: equal property called the Essential
^{or native} Salt of Animal Fluids. ⁽¹⁴⁾ See Dr. Gaubius
§ 316 who from his accurate know-
ledge in Chemistry has pointed out this very
Observation. The Predominance there-
fore of Salts in our Fluids must al-
ways be attributed to an excessive Quan-
tity of this Ammoniacal Salt. This Ex-
cess in Quantity may depend upon
an Interruption of the Saline Excre-
tions of Urine & Perspiration. But as
these alternate so exactly w: ^{the} One another
I imagin no very considerable Disease
can arise from this Cause alone. ⁽¹⁵⁾ We must
therefore call in Other Causes to account for
it. Dr. Gaubius supposes Acids & Alkalies may



418

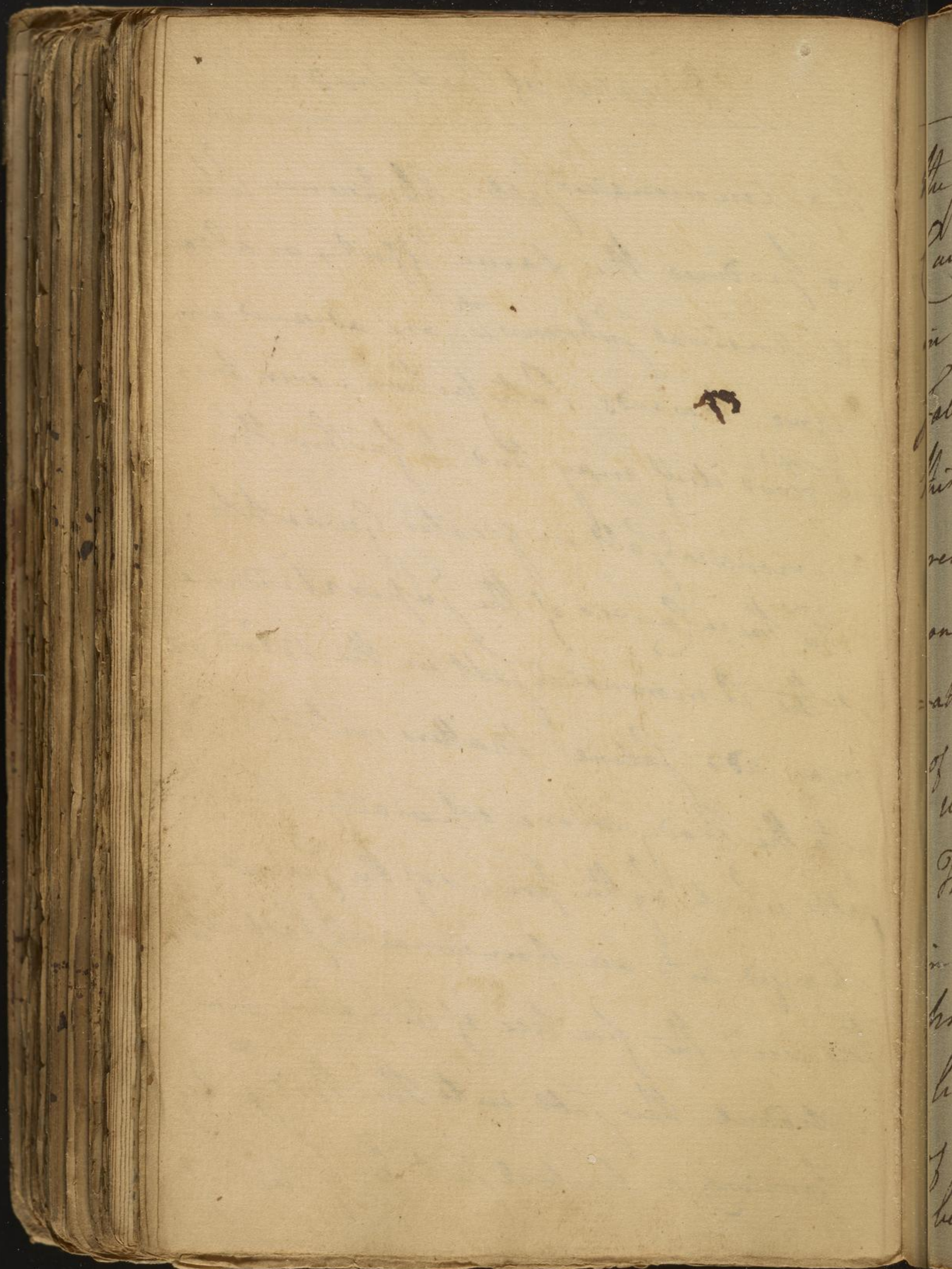
Diseases of the Blood.

give this superabundance of Ammoniacal
Salt, but we shall soon prove that
it depends upon a want of Acids,
instead of an excess of them, & in those
Cases where the Ammoniacal Salt of
our Blood, ^{Acids,} there is no better ^{Remedy} for it than
the free use of Acids. Putrefaction we
now always evolve ^a Salt of ² Ammonia.
kind. Now we know something more
propens to Putrefaction is going forward in
the Animal Economy. But this Putrefaction
always stops at a certain stage in ² Body
^{or} is occasioned by fresh Aliment espe-
cially Aliment of a Vegetable Nature. The
want then of Vegetable Aliment natu-
rally gives Rise to the Generation of



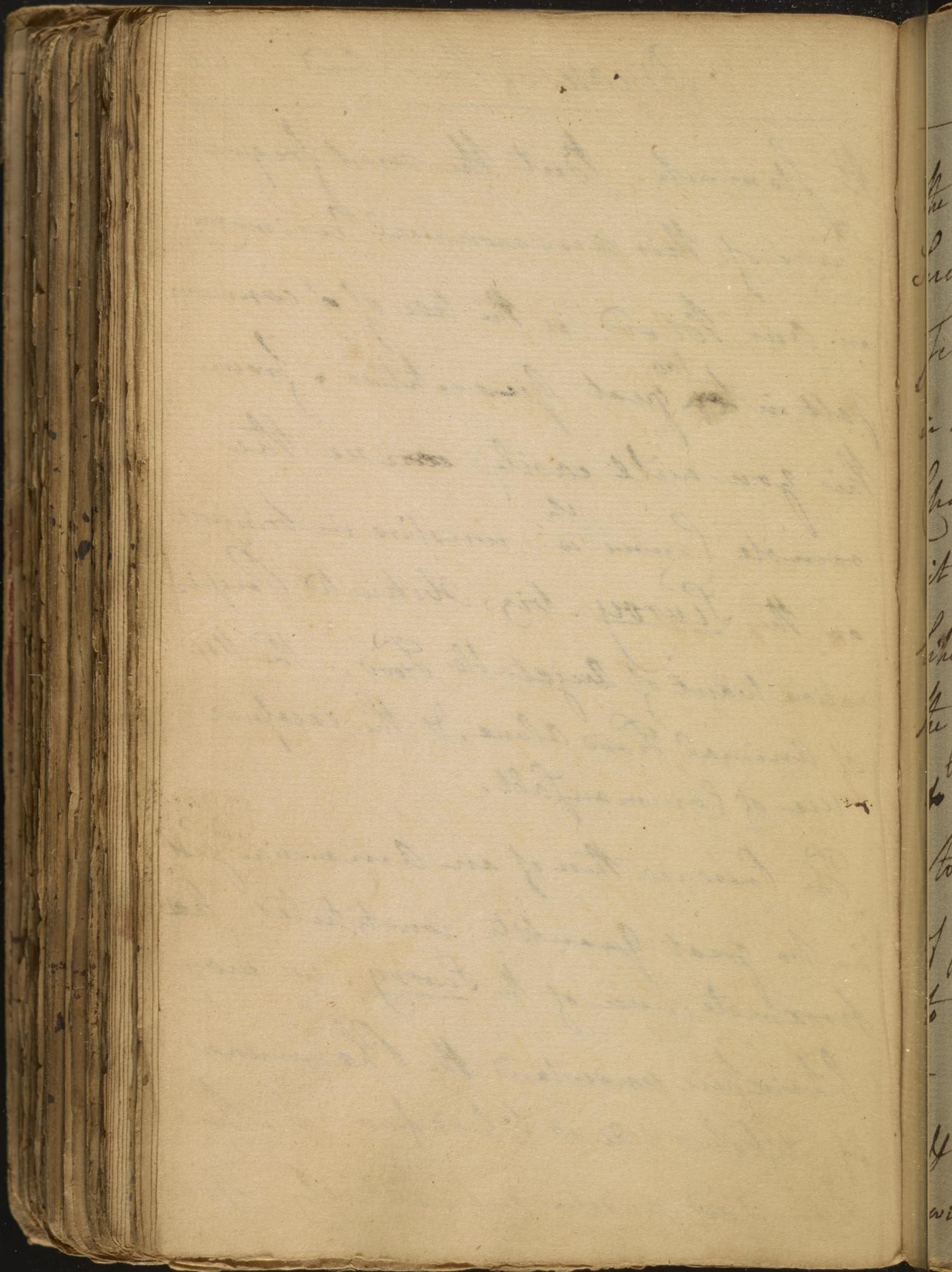
This Ammoniacal Salt. Distillence likewise produces the same Effect, as also all Animal substances ⁱⁿ are advanced any Degree towards Putrefaction. even Animal Food itself may tend to further this Ammoniacal Salt in greater Quantity.

To these Causes of the Superabundance of the Ammoniacal Salt in the Blood are may add Saline Matters introduced into the Body more especially Neutral Salts which by the power of the System are changed into an Ammoniacal Salt. When this Acc^{ts} the free Use of Alkalies may introduce this Salt into the Body by forming a Neutral Salt wth Acid of

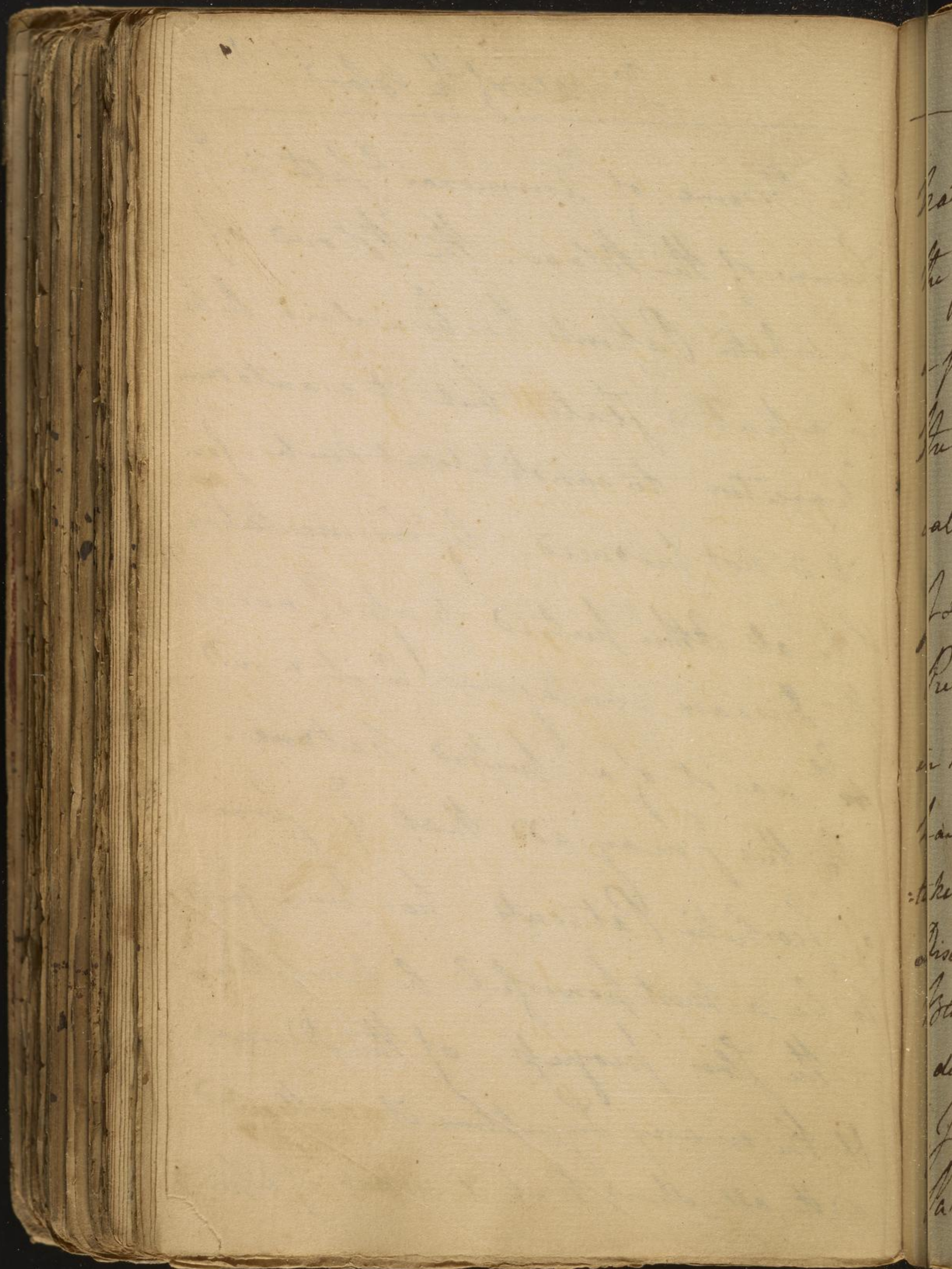


the stomach. But the most frequent Cause of this ammoniacal Curimony in our Blood is the use of ~~a~~ common Salt in ~~too~~ ^{too} great Quantities. From this you will easily ~~con~~ see the remote Cause ^{is} conspire in bringing on the Scurvy. viz: Restrained Respiration want of Vegetable Food, - the Use of Animal Food alone, & the excessive Use of Common Salt.

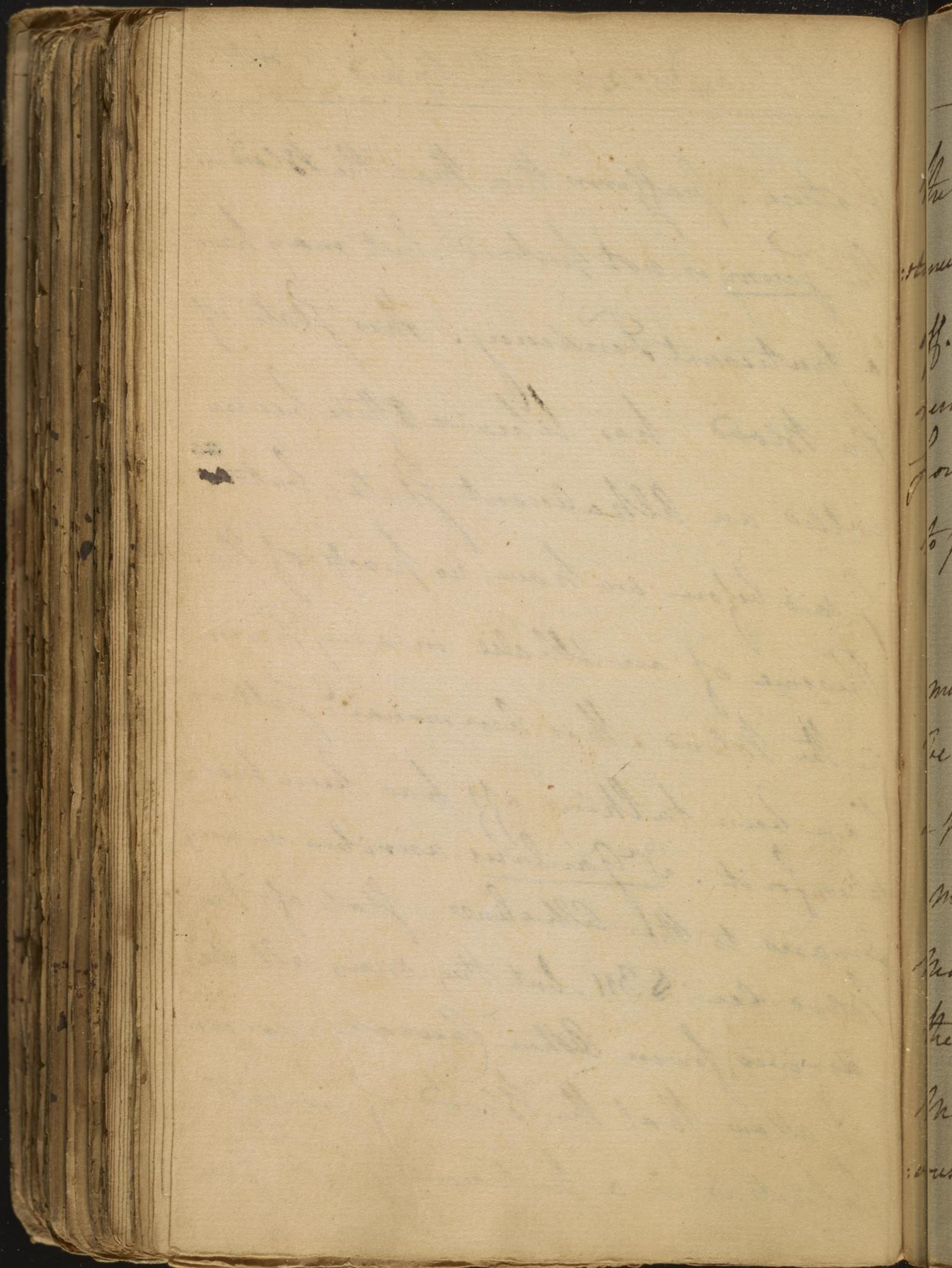
The Presence then of an Ammoniacal Salt in too great Quantity constitutes that proximate Cause of the Scurvy. we may likewise understand the Phenomena of dissolved & Acid Blood from w^h has been said, as depending entirely upon



The Presence of Ammoniacal Salt in y.
Serum of the Blood. The Blood of
Scorbutic Patients has been said to be
in a putrid state, but it wants many
Characters to constitute it such, for
it is not produced by Fermentation
like all other putrid masses, nor is
the Disease contagious ^{as} it would
be if it was of a putrid nature.
To this I may add that y. Serum
of Scorbutic Patients has been found
to be a most powerful Antiseptic.
- The slow progress of the Disease
& the many Symptoms it is attended
with, all show that it is not of a putrid

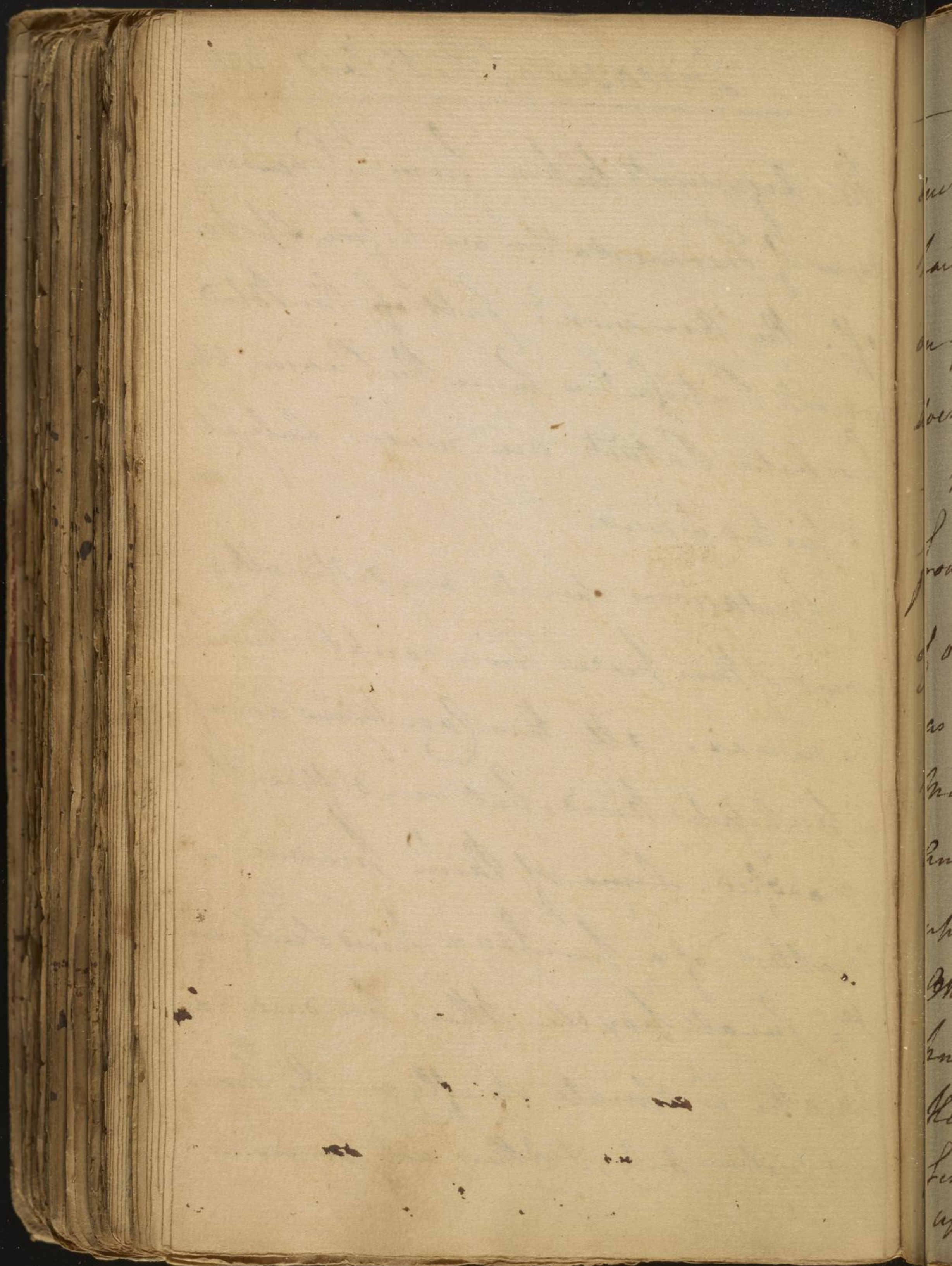


Nature. I affirm then that the Blood in
the fever is not putrid but may have
a putrescent Tendency. This state of
the Blood has likewise often been
called an Alkalascent state, but ~~as~~^{as}
I said before we have no proofs of the
Presence of an Alkali in any form
in the Blood. This Arrmonai? Salt we
have been talking of has been mis-
taken for it. DeGambius attributes many
Diseases to the Alkaline state of the
Blood see § 311, but they may all be
derived from other causes. Now can
I allow that the Blood of scorbutic
Patients is in a putrescent state from



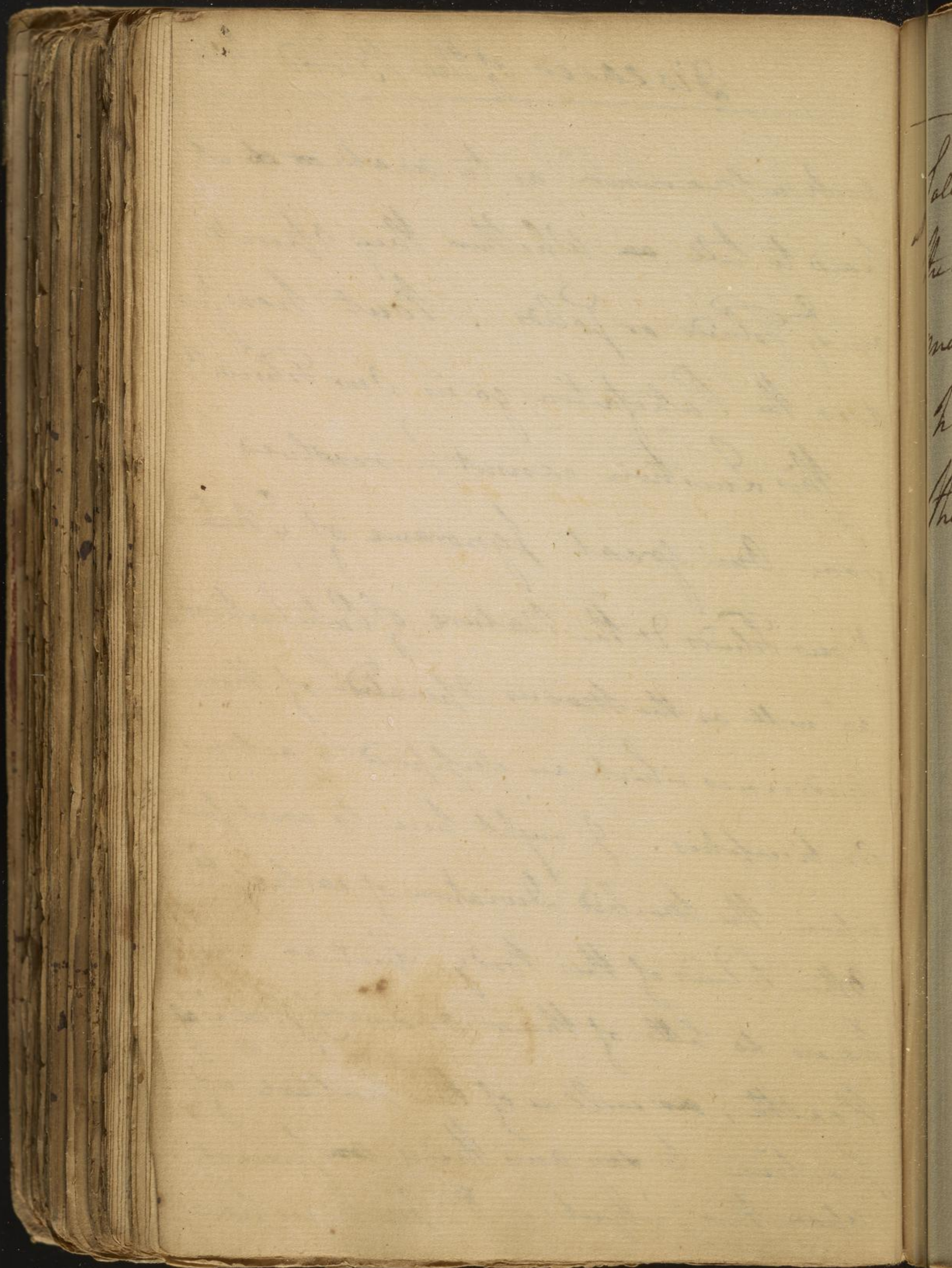
The arguments taken from ^{the} circumstances of Fermentation we before spoke off. The Ammon. salt of the Blood resists Putrefaction hence the Reason why Scorbutic Patients are never subject to putrid Fevers.

Contagions operate very differently. Most of them produce Fever except the ones venereal. all these Contagions are of a putrefactive kind, but very differently modified. Some of them produce a matter of a purulent kind such as the small pox &c Others produce a matter which operates chiefly on the Nervous System only, & Others act ⁱⁿ various in



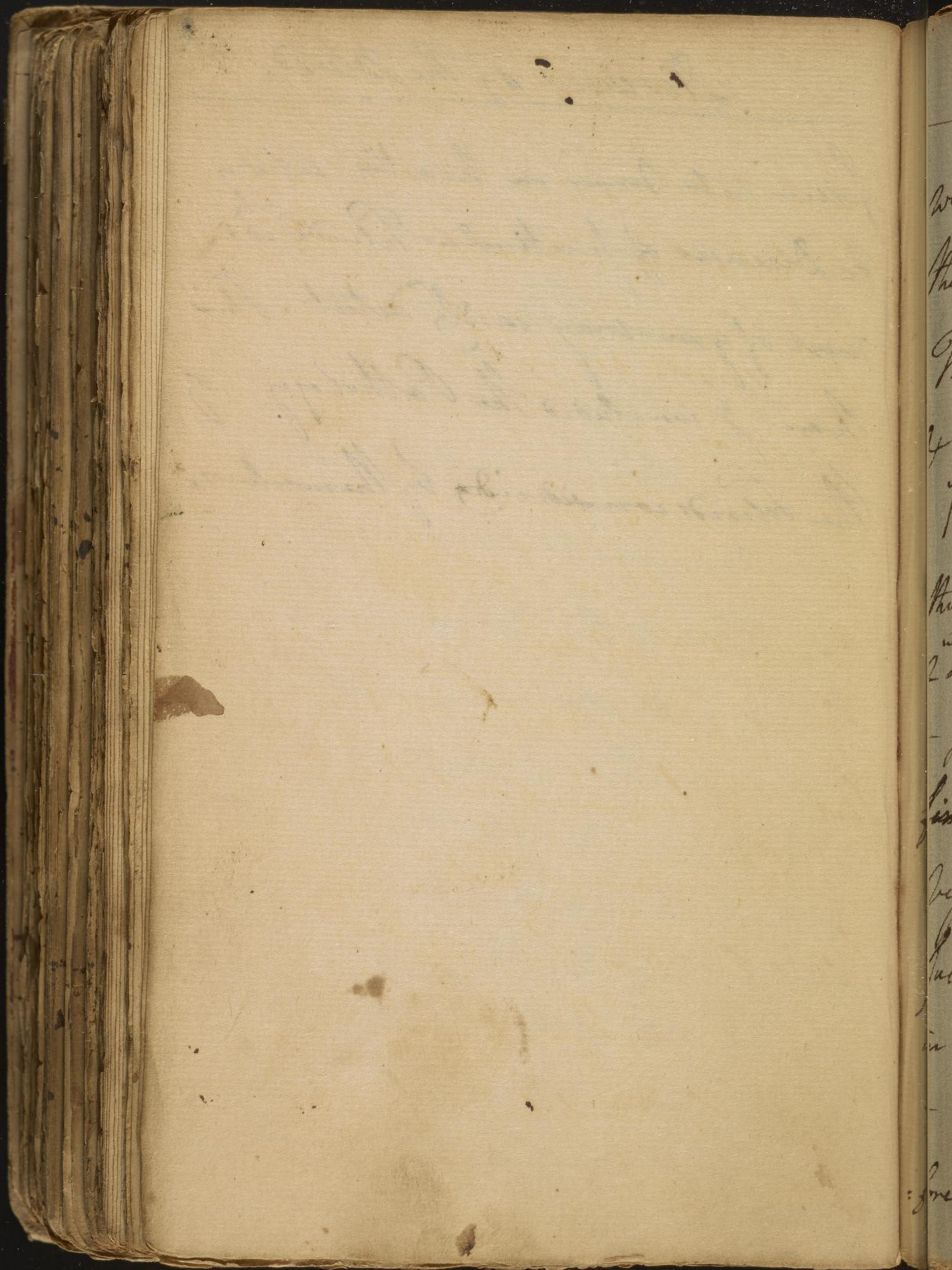
Diseases of the Blood 424

such a manner as to make it
hard to tell ~~on~~ whether they operate
on ^{the} Fluids or Solids. But how far
does the Putrefaction go in our Fluids?
- This Question cannot be resolved
from our great Ignorance of ^{the} nature
of our Fluids & the Nature of Putrefaction,
as well as the Modes Operated of those
Medicines which are supposed to act as
Antiseptics. I ought here to confound
upon the Morbid Deviations of each of the
Other Fluids of this Body, but as we
know so little of their ordinary state ⁱⁿ
Health, as well as of the nature of
Fermentation to say any thing precise
upon this Subject. Dr. Gualtieri has



Diseases of the Blood. 425

fallen into error in treating upon
the Diseases of particular Fluids ⁱⁿ is:
most of you may easily detect. Thus
have I concluded the Pathology of
the Fluids considering by themselves.



426

Relative Diseases of the Blood.

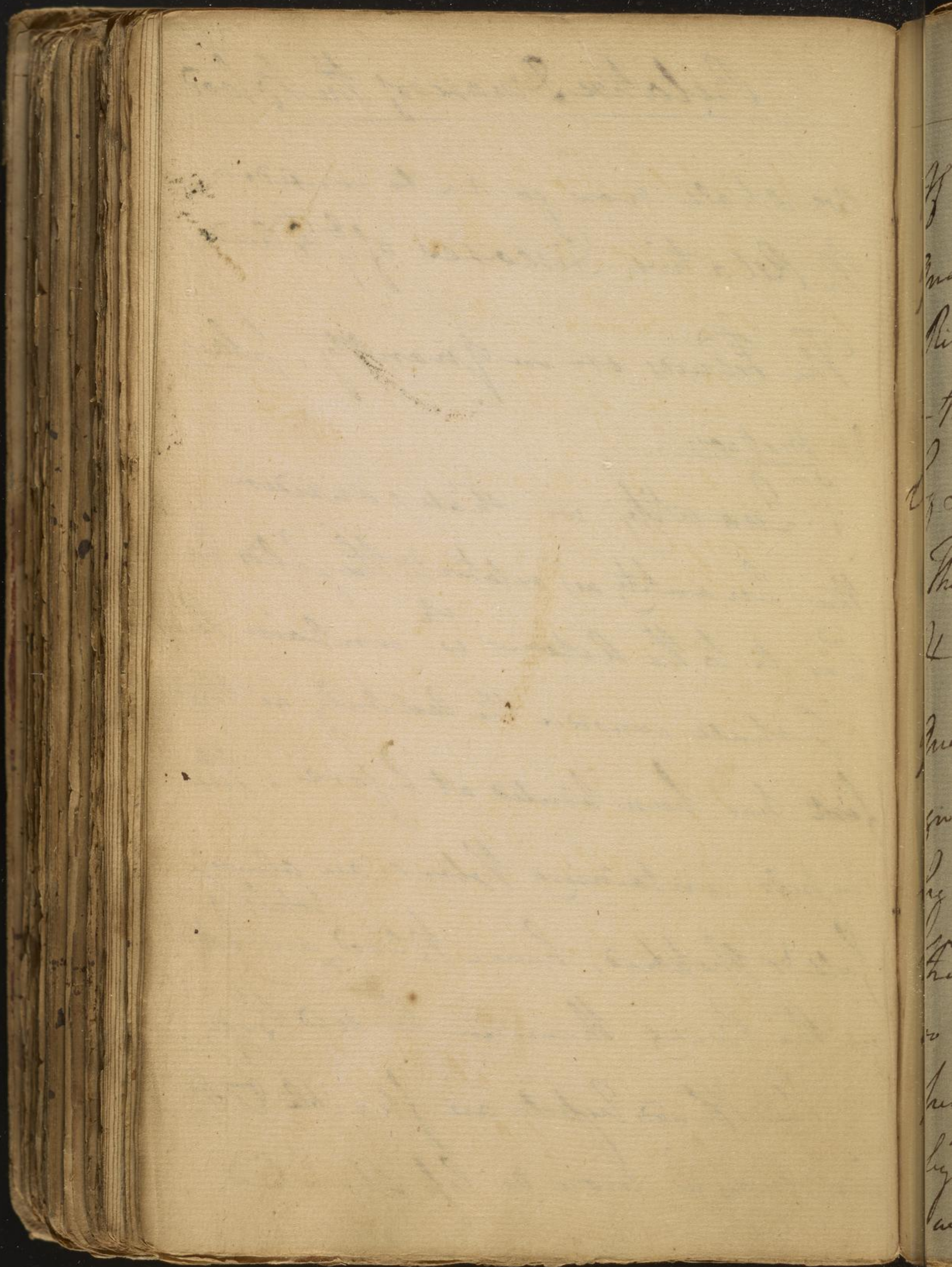
We shall now go on to consider
The Relative Diseases of ^{the} Fluids.

The Fluids err in Quantity, Place
& Motion.

1st Quantity we shall consider
their Quantity as ^{is} relative to the Solids &
2nd as to the Arteries w^{ch} contain them.
- I shall consider the last only as the
first has been hinted at before. The

Vessels containing Blood are always
full & stretched, hence Blood, ^{vessels} are ^{more} lax
in the living than in the dead Body.

- The Blood Vessels are flexible & there-
fore may be more or less stretched.



Relative Diseases of the Blood. 427

If the vessels yield too much an over-
quantity of blood is produced ^{the} gives
rise to a Disease called a Pethora.

- The Reverse of this has been called
by Lincetand Anemia.

The Pethora has been much studied
It many Terms applied to it. a greater
quantity of Fluid than is necessary to
give a proper Tension to y^e System called
by Galenus "Pethora ad motum", but I
think wth little propriety, - When it prevails
so much as to prevent the Functions being
performed wth their usual ease it is called
by the Ancients "Pethora ad vires", but
we shall take no notice of this as it is

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428

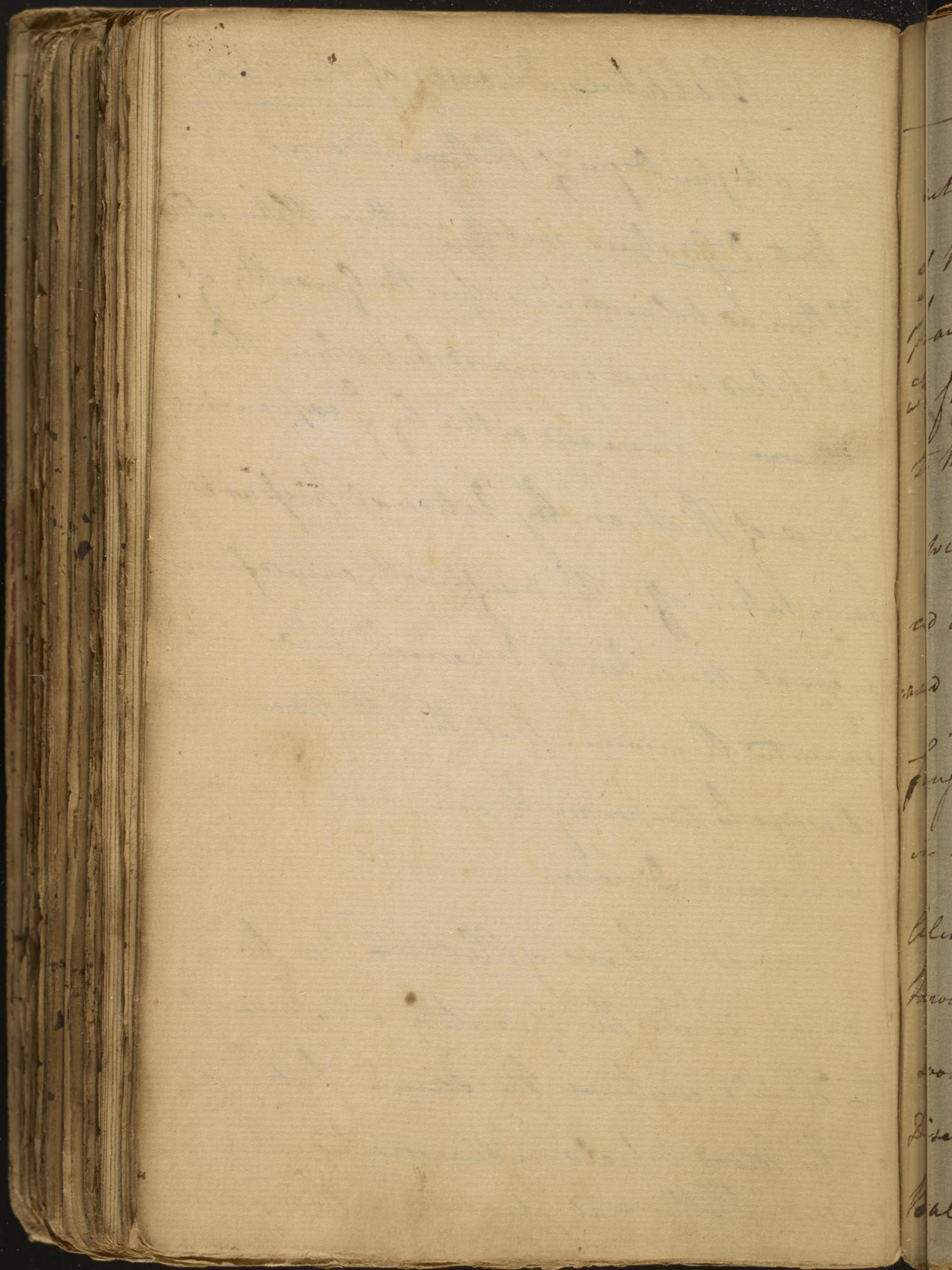
Relative Diseases of the Blood.

only a higher Degree of "Plethora ad vasa".

But DeGaubius makes another Plethora called
"Plethora ad volumen" ^{ch} is when the Quantity of
the Blood is not increased but when ^{the} ~~the~~
volume is increased either by γ expansive

Force of Heat, or ~~by~~ External pressure
being taken off. This is sufficiently evinced from
a great number of Experiments ^{to} made in an
exhausted Receiver. But this Plethora must
always be temporary, & can never give a
permanent Disease.

Another Species of Plethora has been
marked in ^{ch} the Quantity & volume of
the Fluids continue the same but γ Capacity
of the Blood vessels is diminished. This is
called "Plethora ad Spatium". This cannot



Relative Diseases of the Blood 429

act universally in the system, so ² rd Effects
of this species of Plethora will only appear in
particular portions of the System - the Plethora
^{ch} follows: amputated Limbs may be reduced
to the Plethora ad Stratum

we shall begin by considering the Plethora
ad Vasa or Plethora Vera th is an increas-
ed Quantity of Blood th w: th Regard to the
Sanguiferous System. We are daily taking
in ^{our} $\frac{1}{24}$ of the weight of the ~~whole~~ Body in
Aliment. now if this was not immediately
Absorbed but the Quantity of Fluids would
soon be increased as to induce violent
Diseases, but there is generally a due
Balance kept up between the Ingesta

(4) There must be an Increase of $\frac{1}{4}$
power of the Heart th w. Regard to $\frac{1}{4}$ Resistan-
ces, & as the Blood is not absolutely
confined, but allows the Blood to pass
off further there must be a kind of
Balance between the Excretories - veins.
Small arteries & the great vessels and
Heart. If a ready passage was allowed
into the veins the Arterious System w:
never be dilated & expanded. We have
many proofs of the Density of the veins being
greater in the begin^g of Life than that
of the Arteries, & the Resistance of the
Arteries has also the same Effect. It is
easy to see that these are greatest at

Relative Diseases of the Blood. ⁴³⁰

& Secreta, if this is destroyed a Plethora will naturally succeed. The System itself is at particular times disposed to this inequality between the Ingesta & Secreta. I formerly explained that an accumulation of Fluids was necessary to the growth of the body. This accumulation happens only in ^{the} Arterious System. The Languiferous System acts upon it is acted upon. as before the Body arrives at its term all Plethoric Arteries sometime after that period they become venous. Unless this preternatural accumulation takes place in the veins Obesity follows hence the Reason why people grow fat most in middle age. The Balance of the System will vary i. e. at some

first, & that the Ballance will be con-
stantly changing as the parts are stretched
& the Dilatation will always be in those
parts of the Arterious System ⁱⁿ which are most
distant from the Heart as being weaker,
~~otherwise~~ the Force of the Heart & large
Arteries would constantly need to increase
in proportion. So long as ² Difference
is considerable the Inequalities have less
Effect, but at the same time there is a kind of
Plethora ad Spatium, & the Effect of the
Ingesta must depend all along on the
Ballance of the veins & Reaction of the
~~active~~ Excretories. As the Excretories
are first opened we may suppose they require
resisting Force, & so we find they do. &c.

Relative Diseases of the blood. 431

2nd Manhood th is about 36 3rd an intermediate
state from 36 to 50 during th time Men:
menstruation ceases in women. 4th From 50 upward.

The Occasional Causes of Plethora then
are - a larger proportion of Aliment
joined wth stronger Cytoplastic Organs than
the excretory Organs.

2nd Aliment will always induce Ple-
thora as it is more nourishing & less per-
spirable

3rd Aliment &c being given Plethora
will depend upon Exercise, for the less
of this is used the less the Nervous
are & greater the accumulation.

4th Cold wth may act in inducing Plethora

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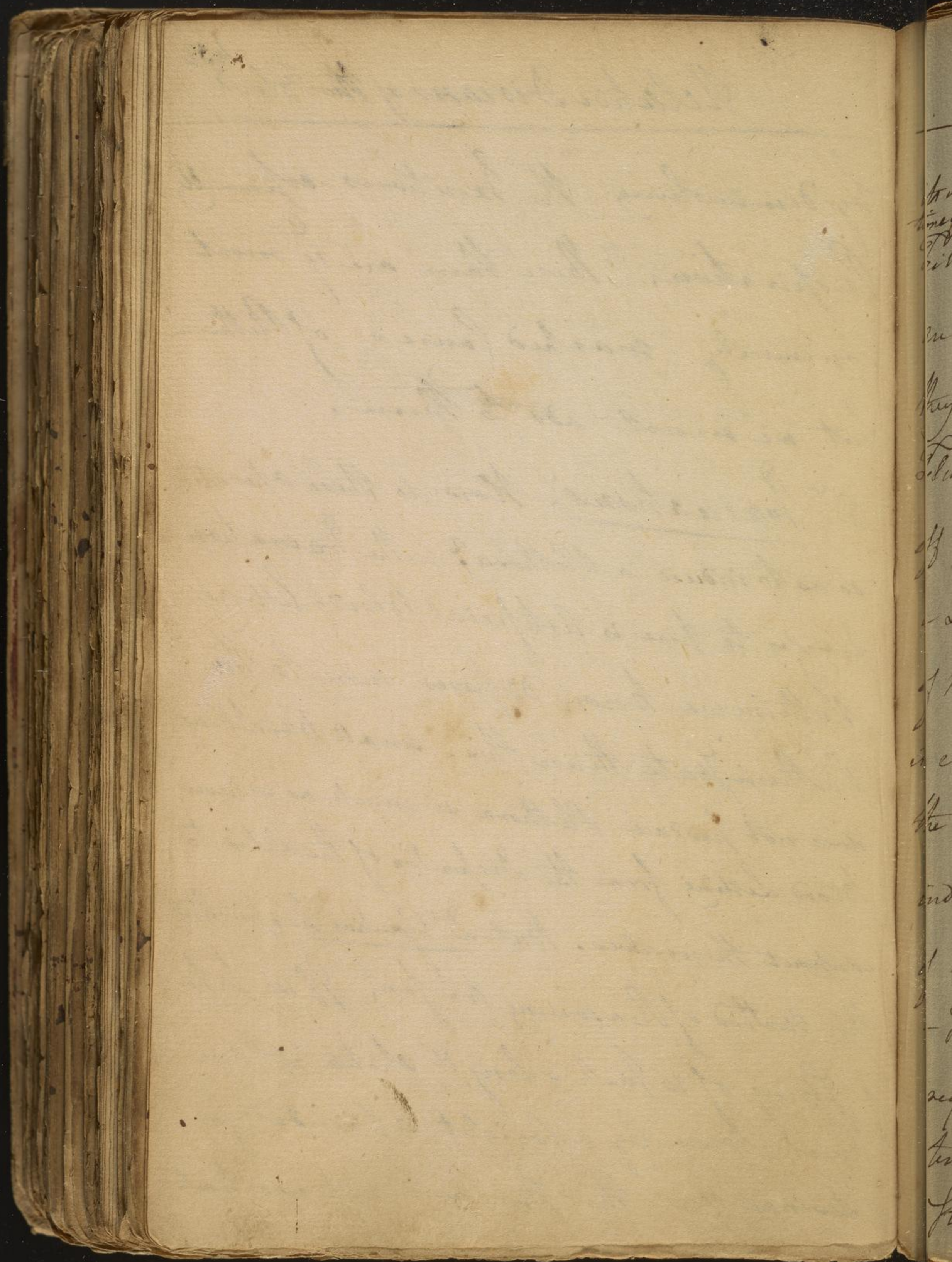
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432

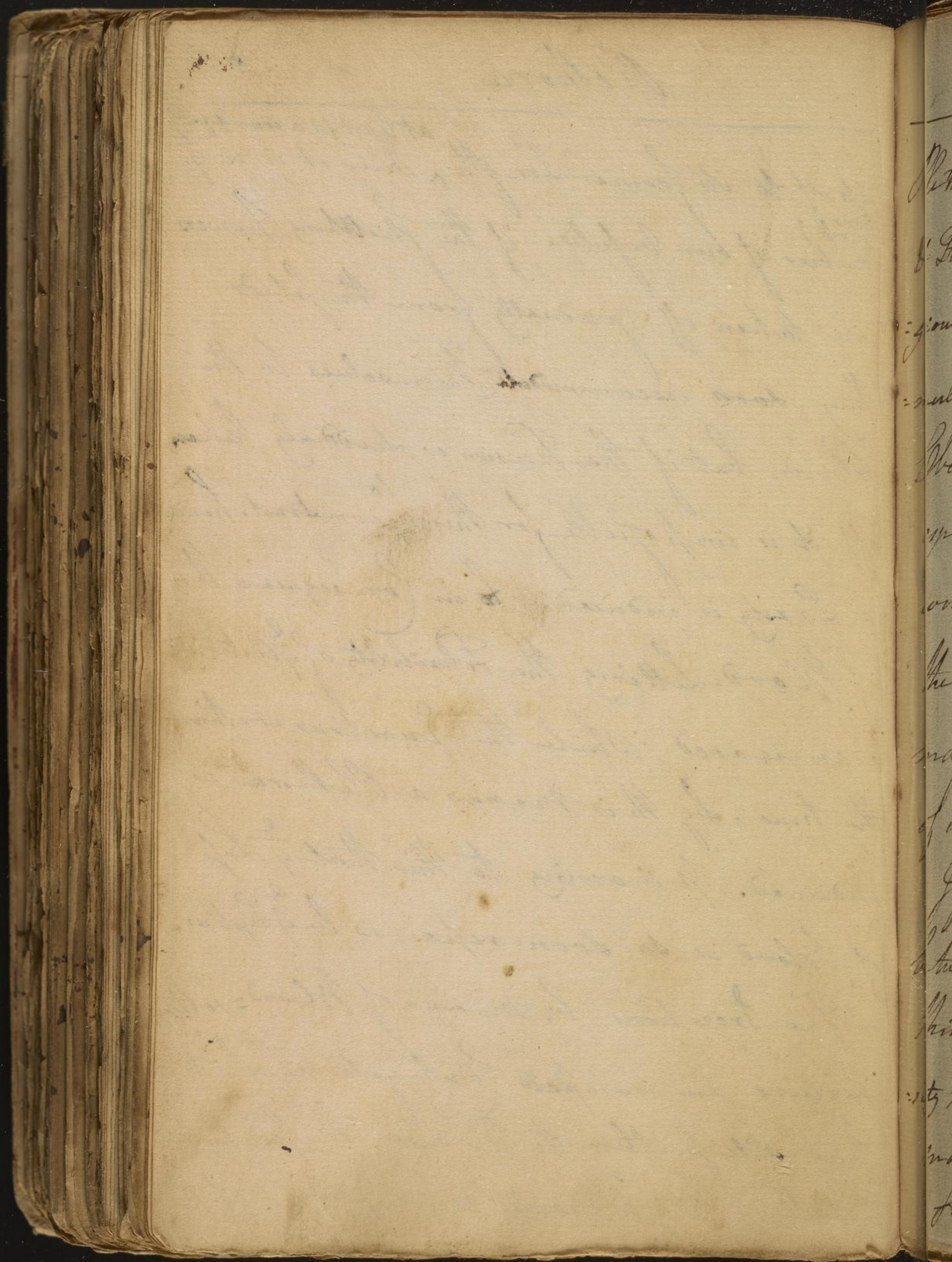
Relative Diseases of the Blood

by diminishing the secretions especially
Perspiration. These then are ^e most
commonly marked Causes of Plethora
but we must add to them.

5. vacuations. How do these operate
so as to induce a Plethora? — The vacuation
I refer to here is artificial blood-letting.
— Nothing we know disposes more to the
Plethoric state than this. small bloodletting
does not produce Plethora so much as copious
blood letting from the disposition of the solid to
contract themselves. But Dr Gaubius has pushed
this method of Reasoning too far. If we take
a string of 10 inches long, & stretch it one
inch more by a weight appended for
several days, this string will not contract

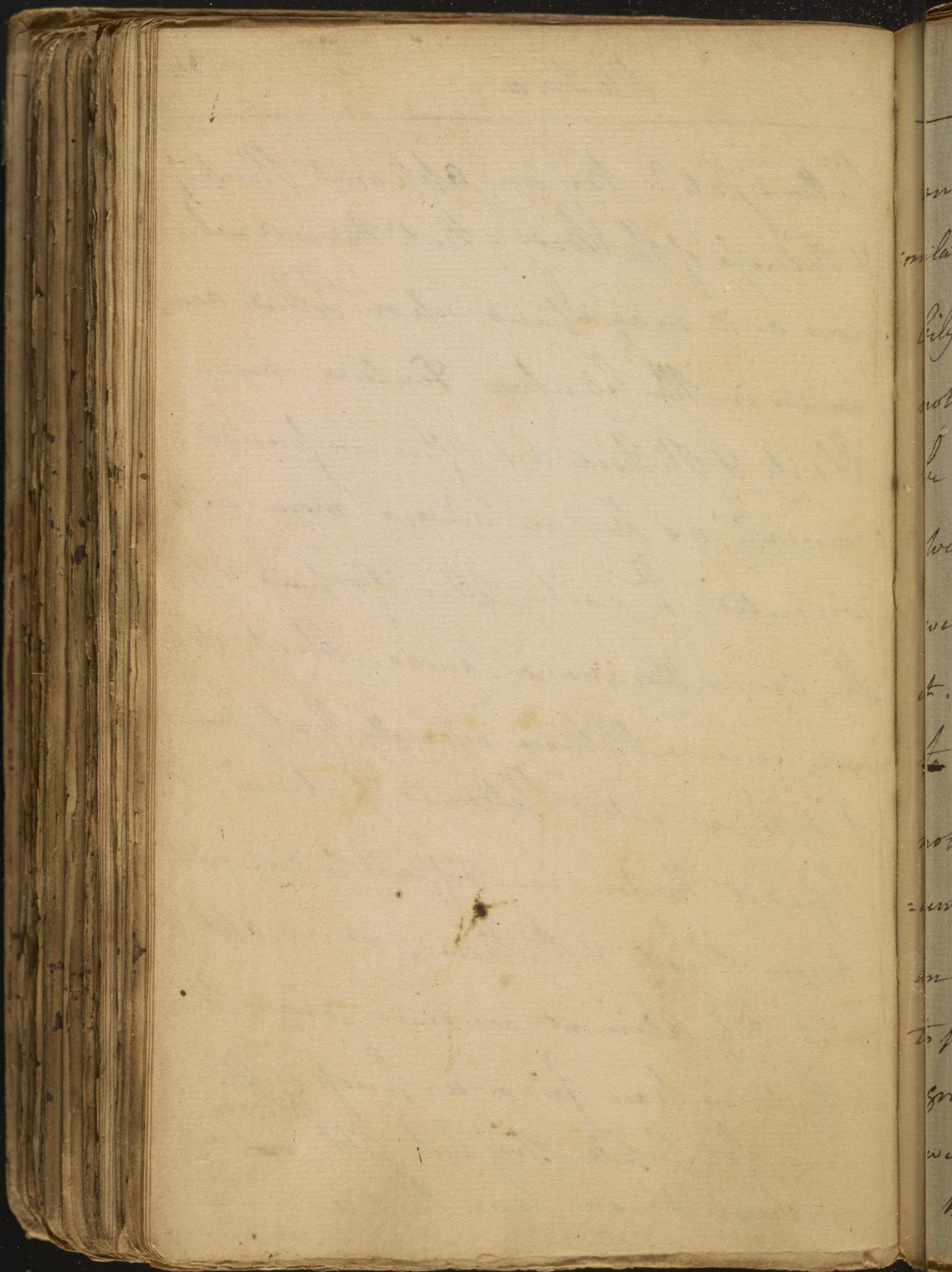


itself to its former Length, ^{at least for a considerable} ~~times~~ thus it is w^y.
 fibres of our vessels. if the stretching powers
 are taken off gradually from the solids
 they soon accommodate themselves to the
 Fluids, but if the Tension is suddenly taken
 off it is impossible for them ^{to} contract. Hence
 a Laxity is induced. & in consequence there
 of Blood. Letting the Flexibility of Arteries
 is increased while the Excretions continue
 the time, by this means a Plethora is
 induced. It is owing to this that ^e Lops
 of blood is so soon repaired by ^e Symp^t.
 - The Excretions by means of Blood = Letting
 acquire an increased contraction which
 tends still further to produce the plethoric
 State. By w^h Marks do we judge of the

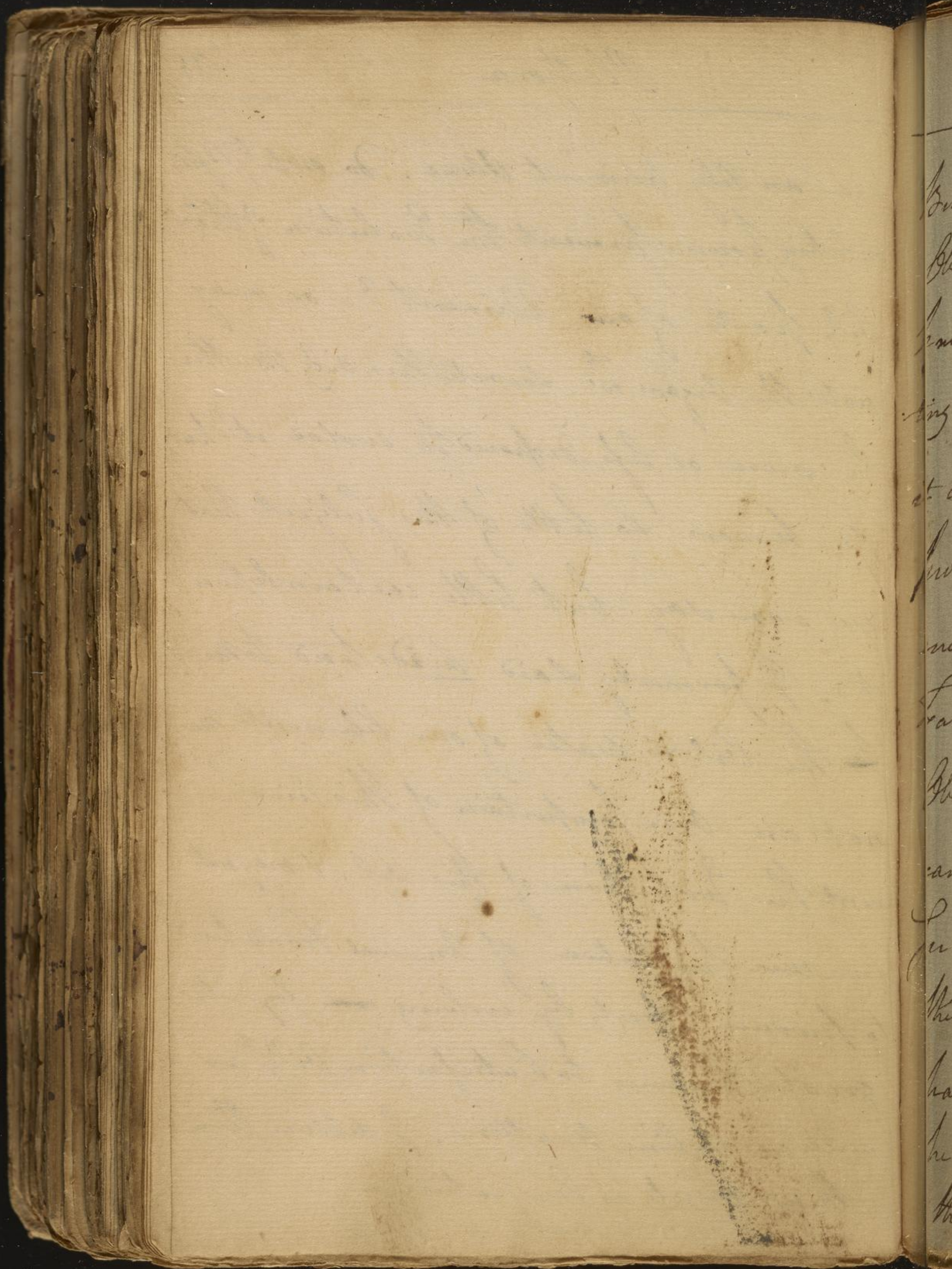


Plethoric state? by an apparent Plumpness
& Fullness of the Body. But this is ambig-
uous as it may depend upon Fluid accumu-
lated in the cellular Texture, hence
Obesity & Plethora are often confounded
especially as they are always more or less
connected th each other & depend upon
the same Occasional causes. Obesity itself
may increase Plethora especially that species
of it w^{ch} we called "Plethora ad Pratum".

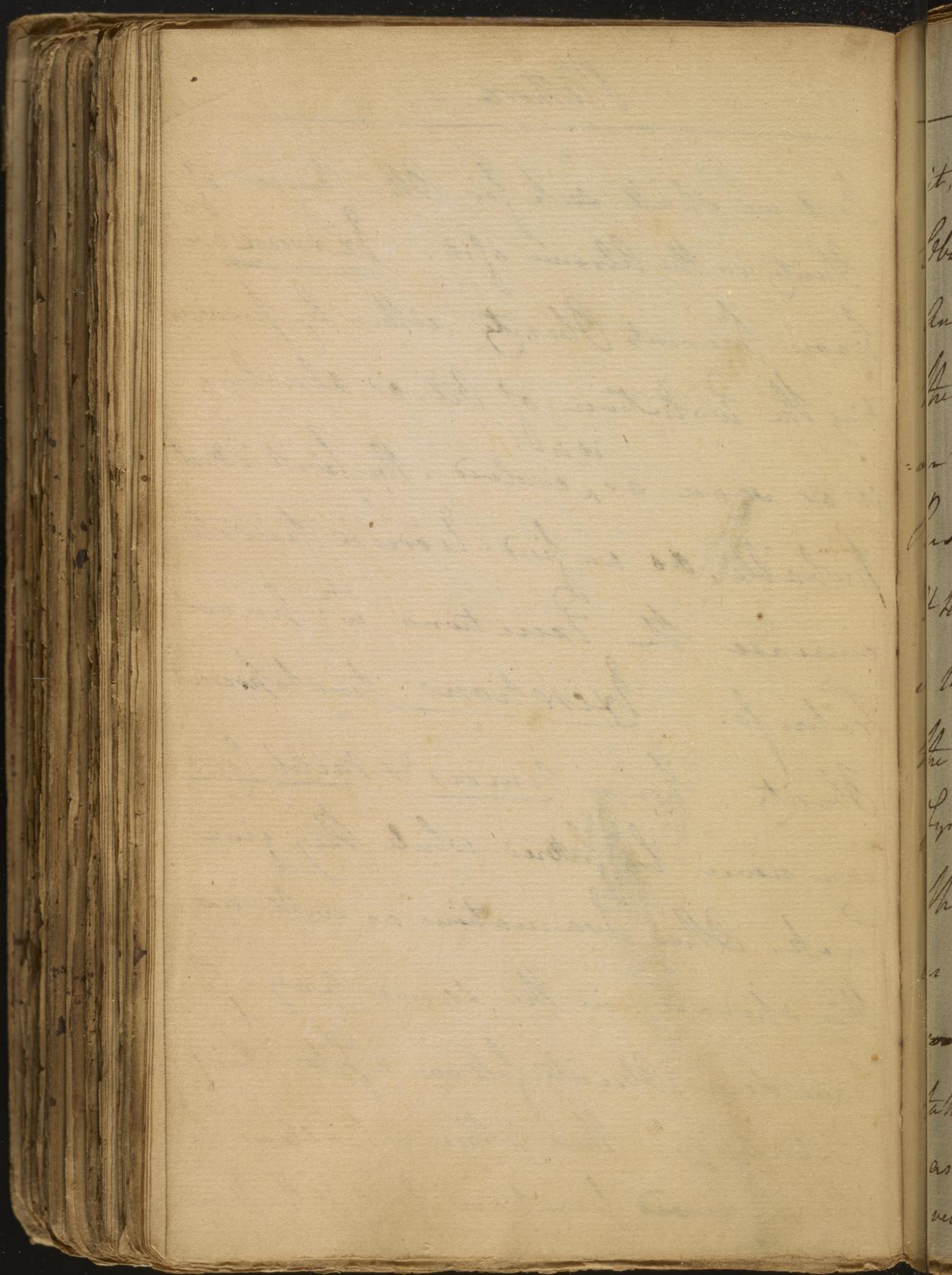
I find it therefore very difficult to distinguish
between Obesity & Plethora. we are apt to
think Oily Aliment conduces towards Obes-
ity but we have few or no proofs of this.
many fat People live but little ~~but~~ ^{on} oily
Substances & many lean People live



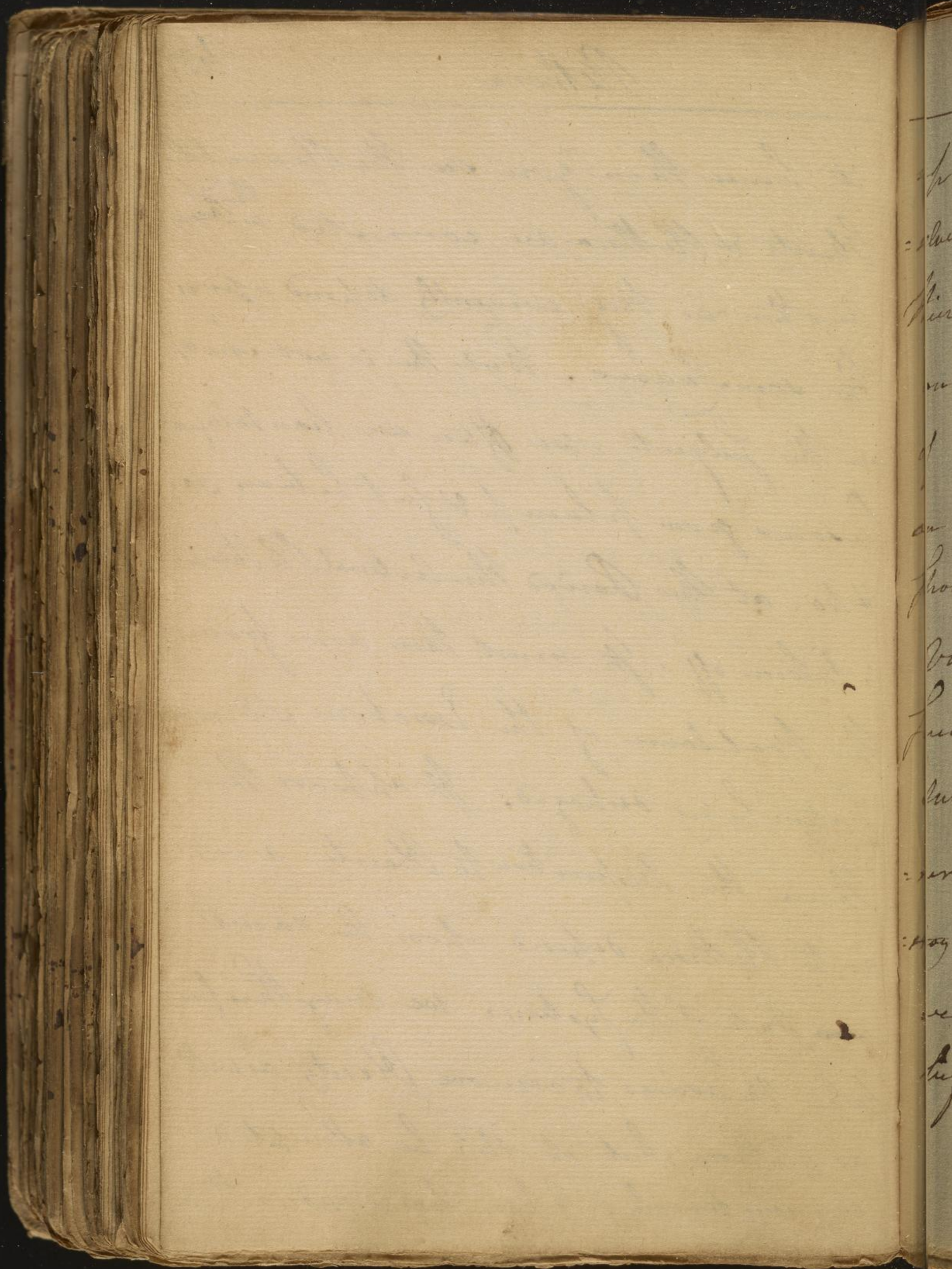
on an oily Aliment Alone. Do not ^{the} Assimilating powers prevent the Evolution of these oily parts of our Aliment? - or may not the Organs w^h secrete this oily matter be more or less disposed to evolve it? But we know so little of this subject that we can say but little certain upon it. I formerly said birds tend to mix the Oil & water of our Aliment. May not an Over proportion of this kind prevent the Evolution of this Oil. It may not an over proportion of Animal Food tend to produce Obesity by evolving ~~an~~ by its greater Tendency to Putrefaction Oily as well as saline matters. I deliver these things merely as Conjectures.



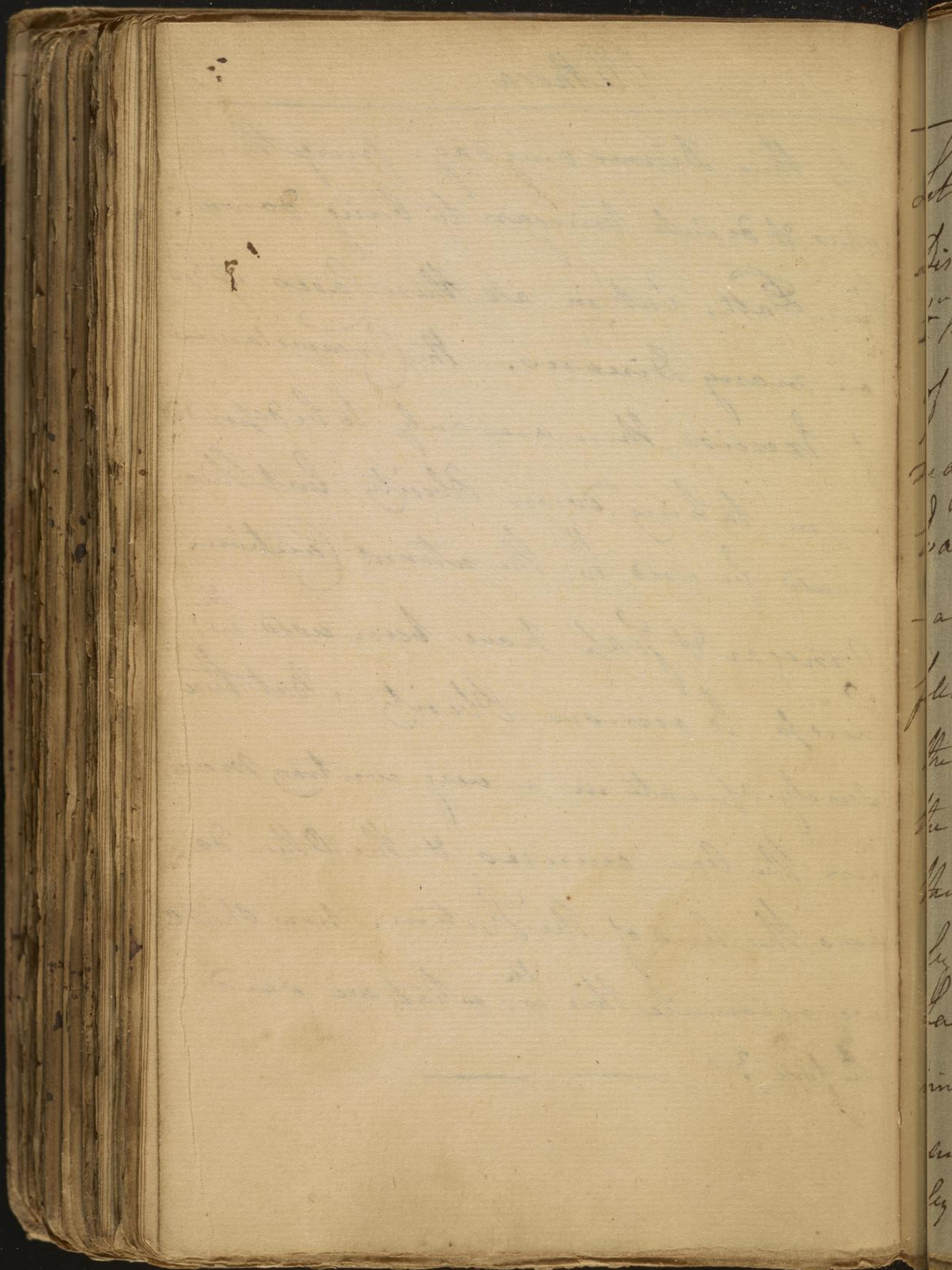
But we shall seek for Other Causes of
Obesity or the Abolition of it. Exercise we
know prevents Obesity either by preven-
ting the Evolution of Oil, or absorbing
it as soon as ^{it is} evolved. The first is most
probable, as we find Exercise tends to
increase the Excretions ⁱⁿ prevent
Fatness. Excretions tend to prevent
Obesity hence Nurses & Milk Cows
can never be fattened while they give
Milk. Other Excretions as well as
this operate in the same way. I
have seen Obesity follow a Gonorrhoea
healed upon. There is then a Ballance be-
tween the increased secretion of Oil & the Excretion



it, hence then you see the Reason why
Obesity & Plethora are connected ^{the} wth one
another as they evidently depend upon
the same causes. But this is not enough
on this subject. we often see lean magre
Persons grow plump & fat between 30
& 40. at this Period the Arterial Plethora
is taken off. It must then arise from
the Ballance of the Excretions & Venous
System being destroyed. It appears then
than the Disposition to Obesity as well
as to Plethora depend upon the same
state of the System. we may therefore
take Measures to remove Obesity as well
as Plethora, but it sh^d. be attempted
very cautiously. I have known Ladies throw

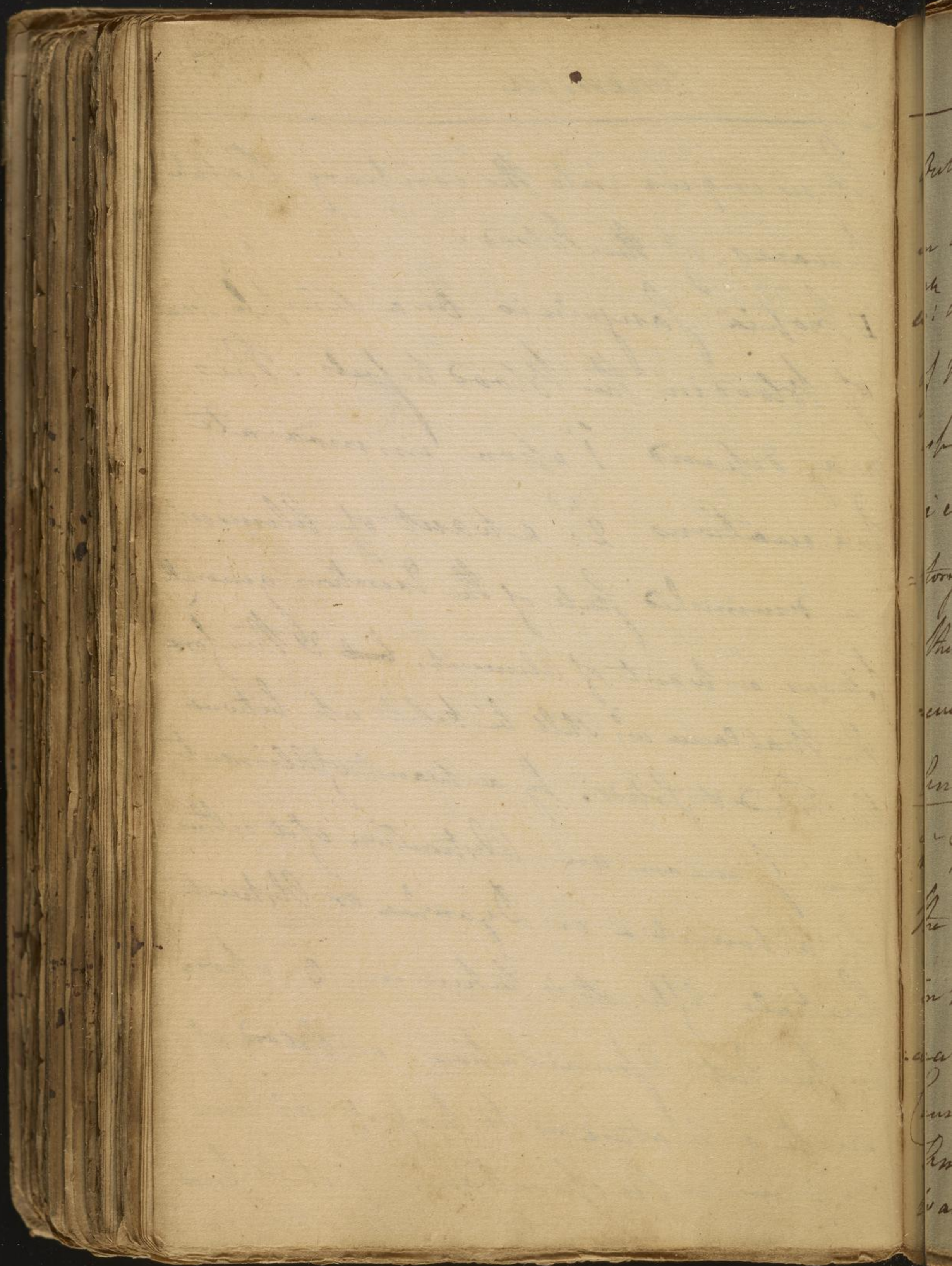


up their Dinner every day - purge them -
selves & drink vinegar to bring down
their Fatt, but in all these Cases it bro't
on many Diseases. The Circumstances
of Exercise then are only to be depended
on in taking down Obesity, but this
should be used w: ^{the} utmost Caution.
Vinegar & Soap have been used w: ^{the}
Success to remove Obesity: But these
surely operate in a very contrary man-
ner the one encreases & the Other de-
stroys the Acid of the System. Now shall
we reconcile this w: ^{the} what we said
before? —————



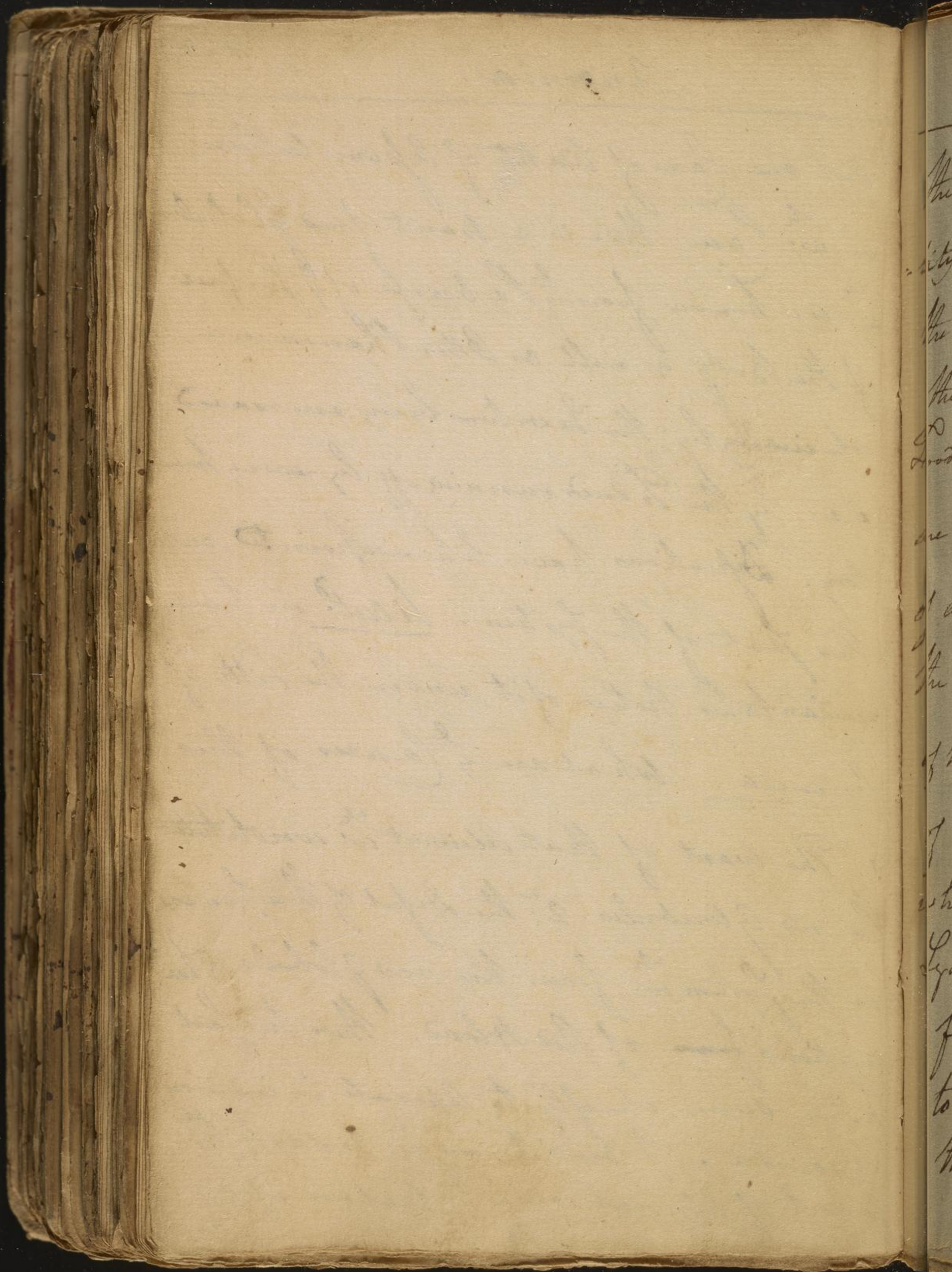
Let us enquire into the contrary Relative Diseases of the blood.

1st Icteria sanguinis, or a simple want of blood in the blood vessels. This may depend 1st upon immoderate evacuations 2nd a want of aliment, - a diminished state of the Excretions generally follows a want of aliment, but I therefore follow the balance w^{ch} shall be kept up between the Solids & Solids. by a want of aliment then I mean an abstraction of it either by a vomit - or Dysentery or Obstructed Lactals after it is taken in. 3rd upon imperfect Assimilation. or Blood of such a nature as to pass off at once by urine or Perspiration. I shall point



But one Cause of want of Assimilation
in ^{the} Case there is a want of red Globules
^{the} we know from ^{the} Pale ness of ^{the} surface
of the body as well as other Phenomena,
especially by the Excretions being increased
i.e. by the Fluids running off by every mem-
-brane. Dissections have likewise pointed out
this state of the system. See in Part
-icular takes notice of it under the Title of
Anemia. What are ^{the} Causes of this

1st The want of that Element ^{the} constitutes
the red Globules. 2nd The Defect of those powers
in the system ^{the} form the red Globules 3rd ^{the} wa-
-rations ~~from~~ of Red Blood. These two last
Causes seem chiefly to operate in inducing
Anemia. I don't know ^{the} to say to the
want of Element, or to ^{the} nature of it.



The Bull & the Lion have an equal Quantity of Red Globules in their Blood, as also the Peasant who lives on oatmeal, and the rich Citizen who lives only on animal Food. The powers of Assimilation then I suspect are chiefly defective & the principal Cause of a Deficiency of Blood. Hence we find the Chlorosis always succeeds a weakness of the Cylopoetic Organs. The Consequences of this Anemia are a want of Tension which induces a general Debility in the System. And if we admit the use we formerly assigned to the Red Globules viz to retain the more fluid parts of the Blood, the want of Red Globules will naturally

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tend to suffer the more fluid parts of the
Blood to escape thro' the numerous patent
Vessels ⁱⁿ abound all over the System. to
prevent this Disease I believe the Red Glo-
-bules are always in a very large proportion
in growing Animals. When they are dimi-
-nished the Fluids run off thro' every Immunity
either internally or externally producing fer-
-ous Discharges or Dropsies - hence the Rea-
-son why Dropsies so often succeed Ha-
-morrhages. How far may the want of
Coagulable Lymph tend to bring on this
Anemia? This Subject I formerly said
was deeply involved in Obscurity, & I
shall therefore pass it over. I shall only

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Observe that this Anemia always tends
to bring on a want of Tension & Debility
in the System more especially of the
Stomach & Chylificative Organs. It ap-
pears likewise in the Brain. Reverend
Dr. Morgagni tells us that they al-
ways found the Impia sanguinis prevail
most in the Brain, & instead of Blood
they generally found Air in $\frac{2}{3}$ Blood: rep.
which detaches itself from $\frac{2}{3}$ Ordinary
being taken off.
Therefore it was used to; this want of Tension
in the Brain disposes greatly to Lycoria.
Delirium Animi &c.

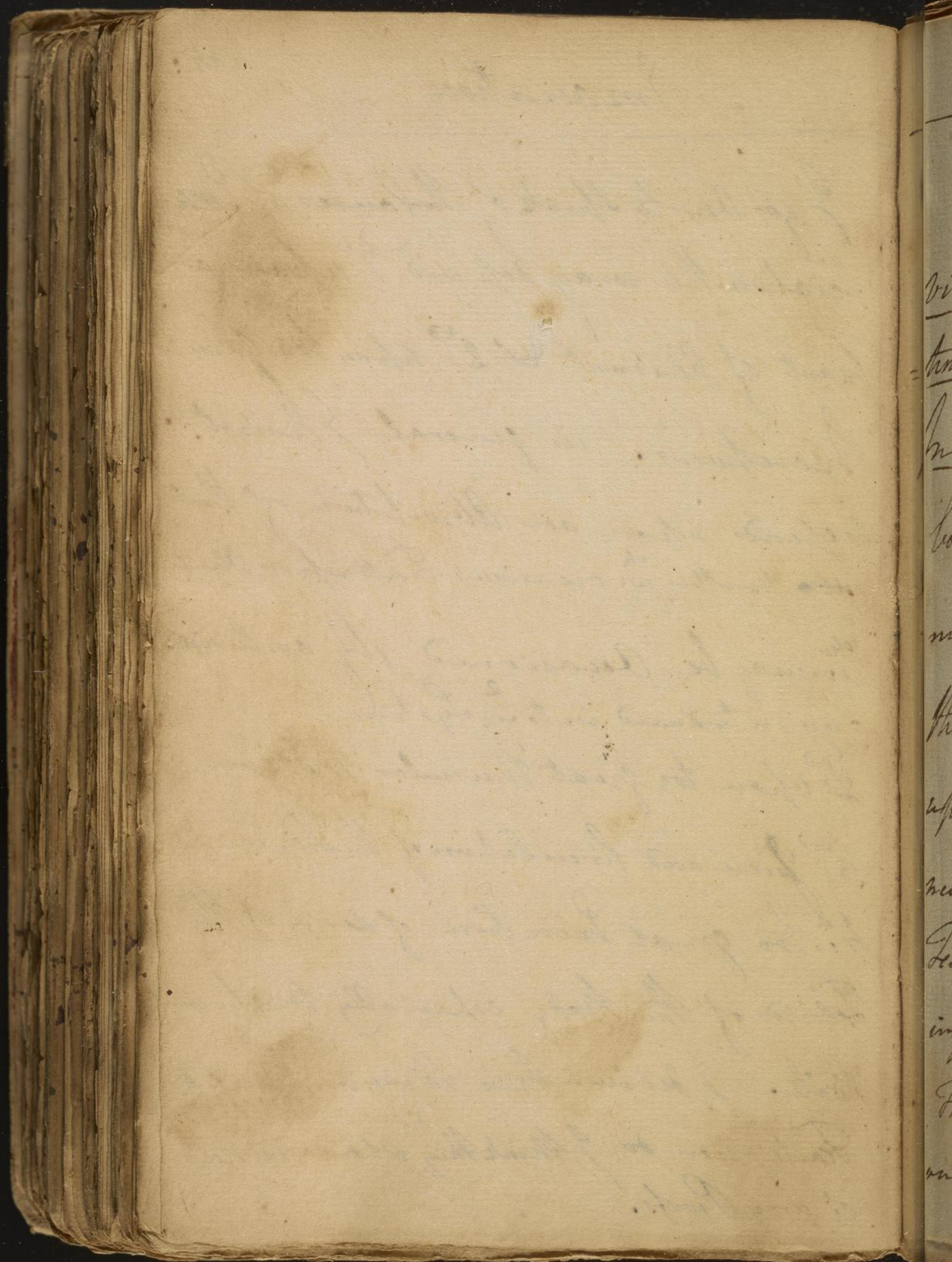
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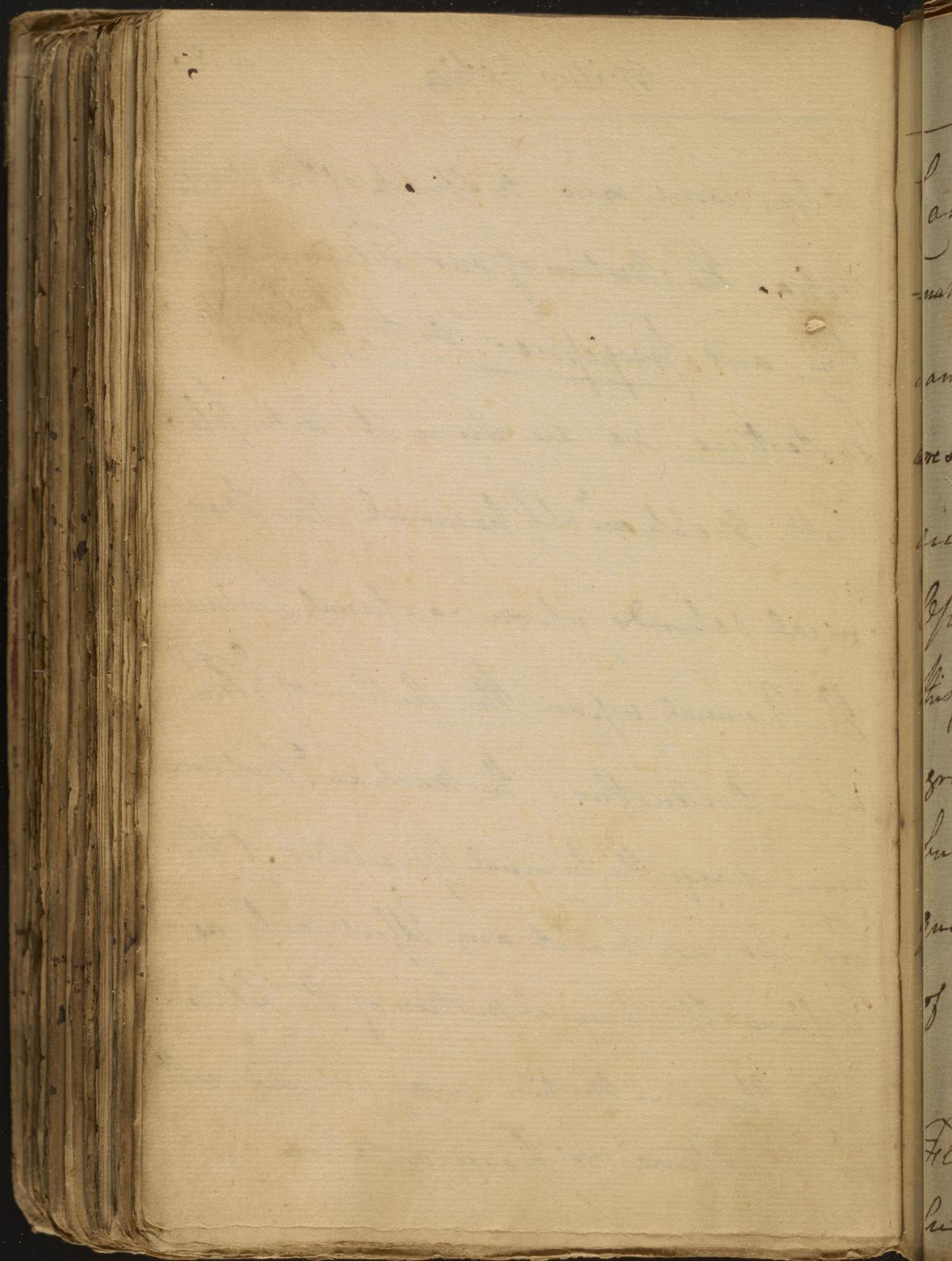
Ima^{or}iation

444

I go on to speak of the Causes of Ima-
ciation. This may depend 1st upon a
want of Aliment & 2nd upon too great
Excretions. in general I think it
depends upon an Absorption of that
~~the~~ matter ⁱⁿ w^h occasions Fatness or Obesity
^{ch} w^h may be occasioned by an humor
being introduced into y^e System.
^{ch} 2nd upon too great Muscular Motion
3rd upon the Force and Circulation of the Fluids &
4th too great Excretion of some of the
Fluids of the Body especially Milk or
Bile. I deliver these things as simple
Facts, nor do I think they stand in need
of any Proofs. —

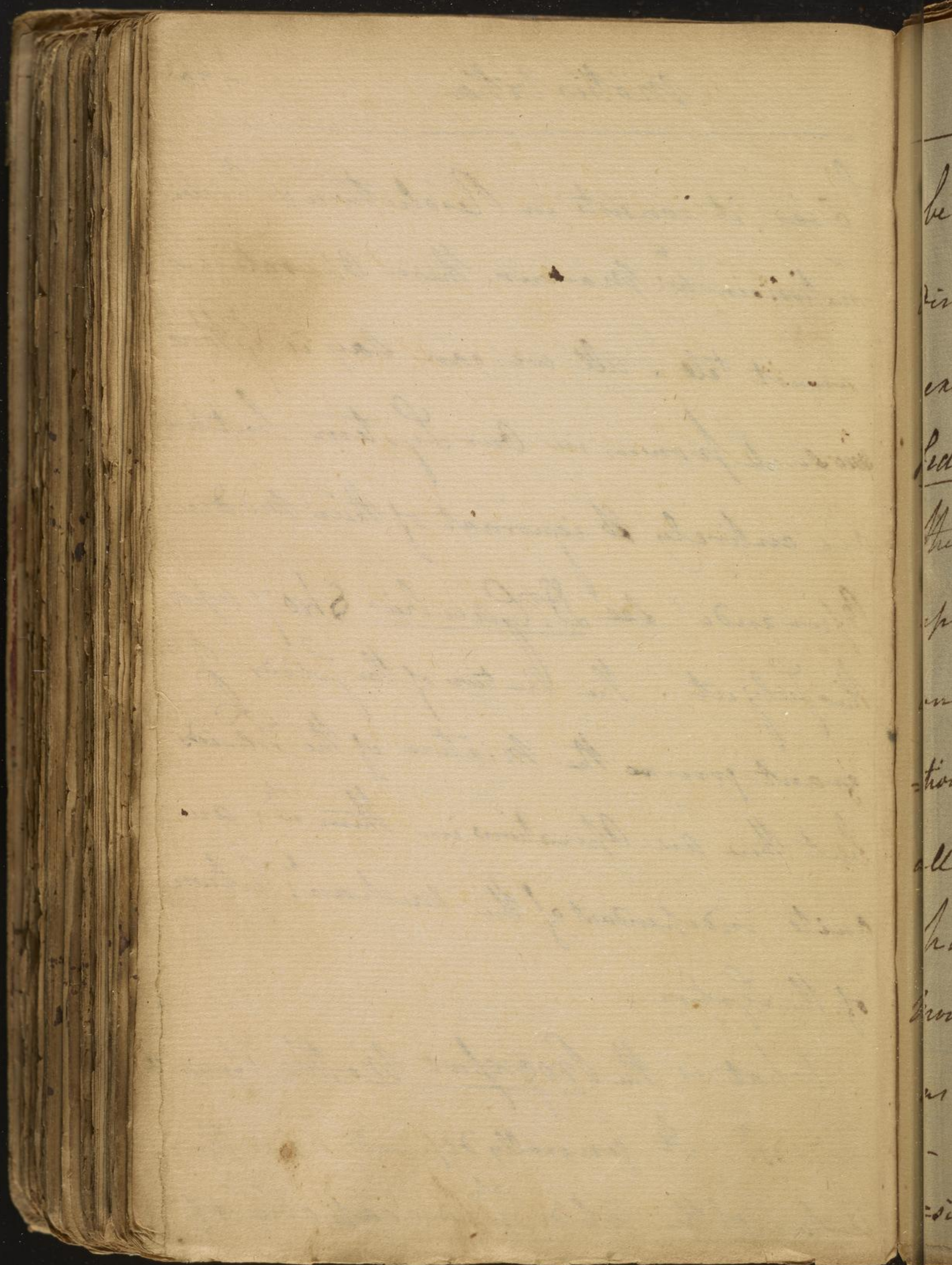


We come now to speak of the Motus
vitia. The motion of our Fluids is inter-
stine and propulsive. as to $\frac{1}{2}$ first viz
Intestine we are sure it takes place
both Mechan & Chemical. The Mecha-
nical depends upon external impulse.
The Chemical upon the action of $\frac{2}{2}$ Fluids
upon One another. The Mechan: Motion
never changes the Chemical Qualities of the
Fluids, nor has it any Effect only as it
influences the Chemical motion of the Fluids.
The Chemical motion may depend either
on mixture or Fermentation. in both

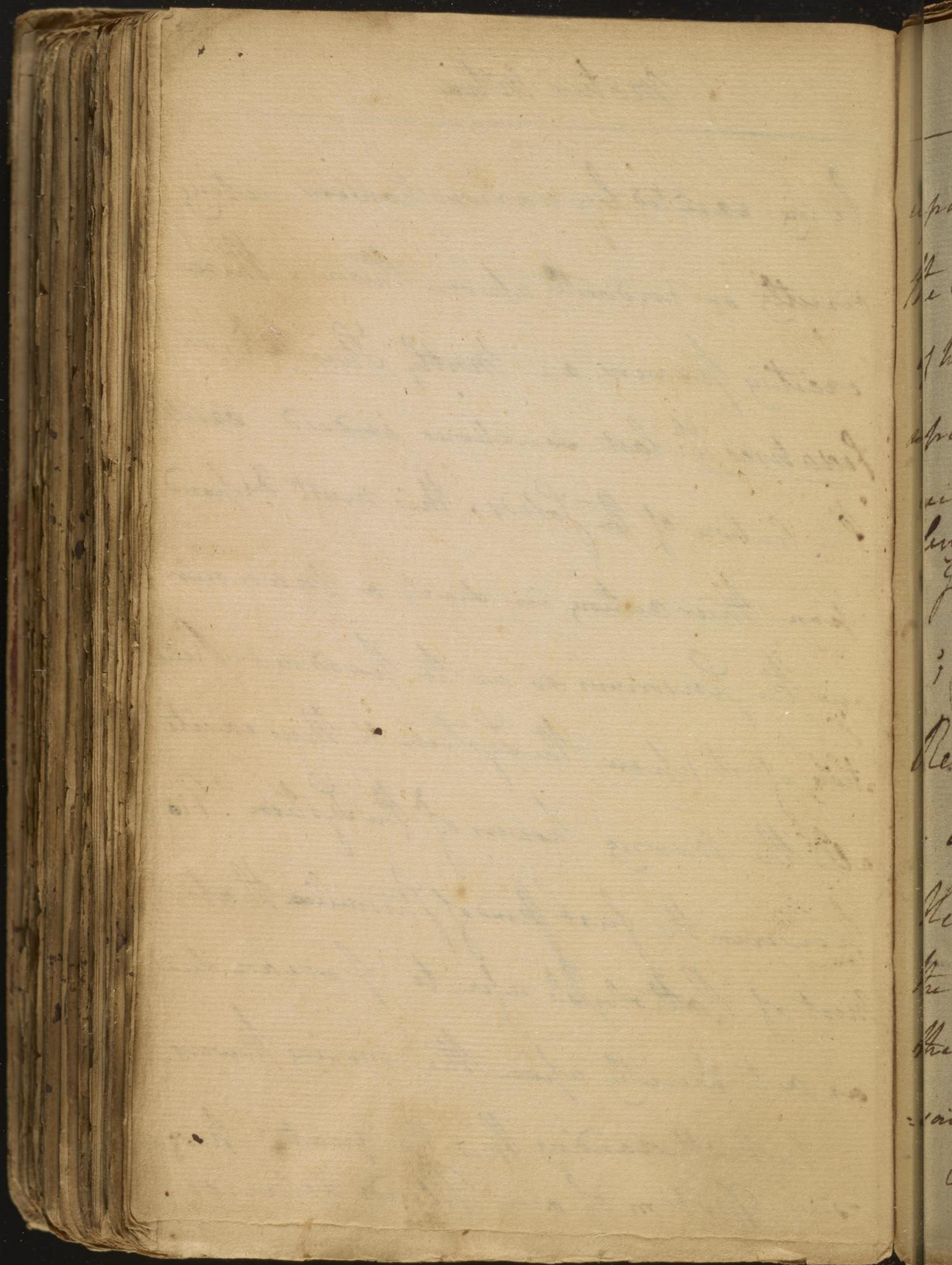


Cases it consists in Resolution & Combination in w^h Manner these Operate we cannot tell. All we can say is if there are such powers in our System but we are entirely ignorant of their Modus Operandi. See D. Gaubius § 407 upon this subject. The Action of the Solids & grant governs the Mixture of the Fluids but there are Operations in them w^{ch} are quite independant of the Mechan^{ic} Action of the System.

What is the Progreſſive Motus of our Fluids? It generally depends upon the Action of the Solids w^{ch} are capable of



being excited by various powers acting directly or indirectly upon them. These exciting powers are mostly Stimuli, or Sedatives ^{ch} last sometimes indeed excite the action of the Solids. This must depend upon their acting in such a manner on the Sensorium so as to produce a Reaction of it upon the System & thus excite all the moving powers of the System. 'Tis however the first kind of Stimulus that most of Pathologists refer to I mean such as act directly upon the moving powers. - notwithstanding this the great progressive Motion of our Fluids depends



upon Stimuli that act Indirectly upon
the System. ^{viz Fever.} Dr Boerhaave in § 586

of his Aphorisms imagines Fever depends
upon direct Stimuli. But in this he is

certainly wrong ^{as} I could prove at same
length was this a convenient place. ~~Ugior.~~
I reduce the Cause of Fever to 4. ~~1~~

1 Cold, 2 Fear, 3 Contusion & 4 a
Resistance in the Languiforous System.

- all these weaken the Action of the
Heart, in such a manner as to excite
the Reaction of the Sensorium to overcome
the Resistance induced by the Causes before-
said.

On what does a slower Motion of $\frac{c}{y}$

[Faint, illegible handwriting on aged paper]

[Faint, illegible handwriting on the right edge of the page]

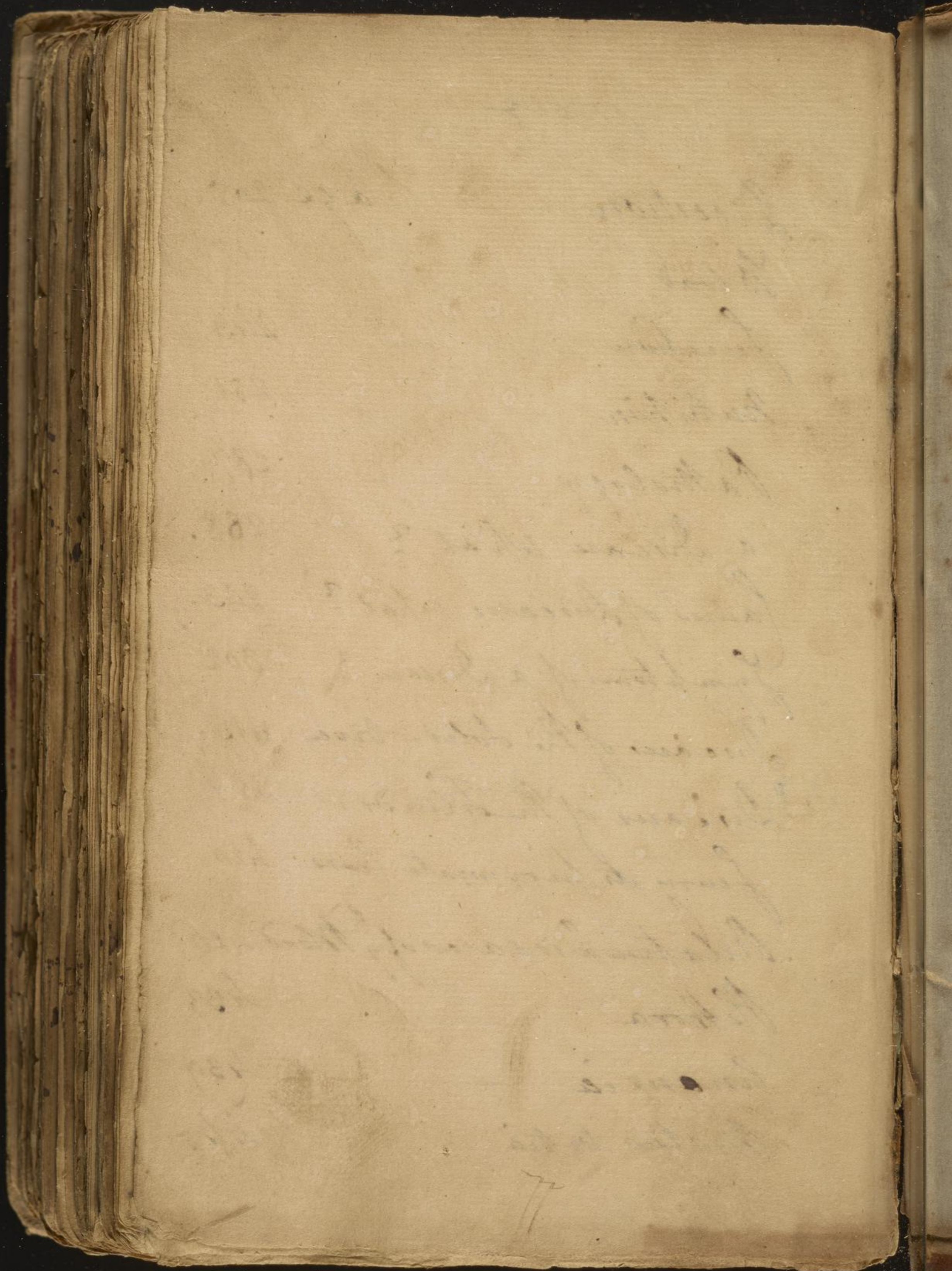
Fluids depend? on a diminished
action of the Solids alone, not depending
on Obstruction for I do not think this
can occasion a slower Motion of the
Fluids, much less do Irritation a
Lenitor or viscosity of the Fluids is capable
of producing such Effects.

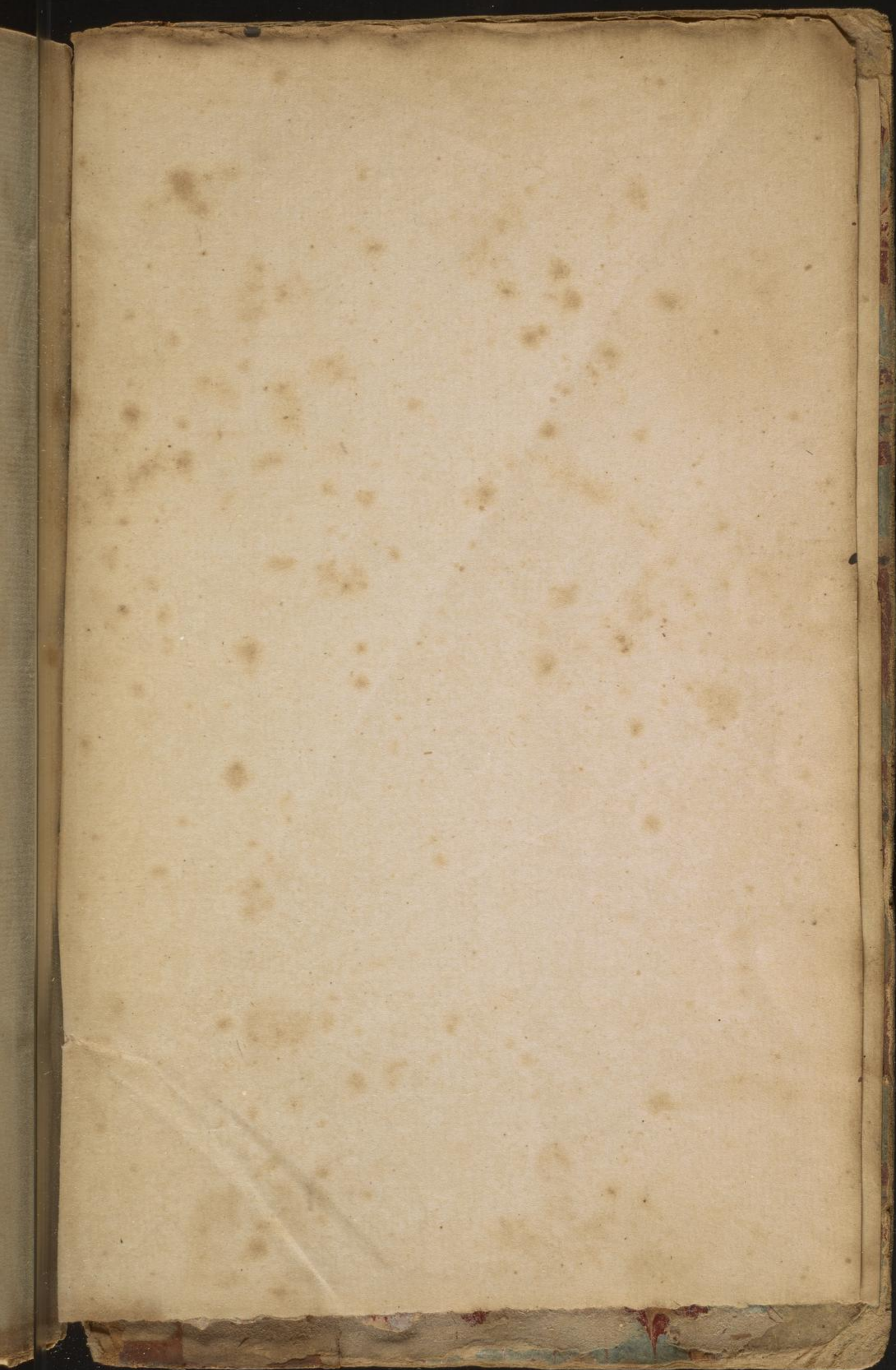
on what does an increased Motion
of the Fluids in particular parts of ^{the} Body
depend? It is upon an Inequality of ^{the}
Blood's Distribution from the greater Vicinity
or Distance of parts from the Heart
or from their more oblique or direct
situation. It is upon this Reason

Epilpzy &c 348 &c

Index

Digestion — —	page 205.
Blood — — — —	215.
Function — — — —	243.
Nutrition — — — —	251
Pathology — — — —	287.
a Disease what?	288.
Causes of Diseases what?	293.
Symptoms of a Disease?	302
Diseases of the Solida Viva	313.
Diseases of the Fluids.	354
Fever its proximate Cause	420
Relative Diseases of ^L Blood	426
Plethora — — — —	433
Anamia — — — —	439
Motus vitia — — — —	445





22.

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18

